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AIR MINISTRY — DIRECTORATE OF CIVIL AVIATION

ANNUAL REPORT ON THE PROGRESS OF CIVIL AVIATION

April 1st, 1925—March 31st, 1926.

*Presented to Parliament by
Command of His Majesty.*

LONDON:

PUBLISHED BY HIS MAJESTY'S STATIONERY OFFICE.

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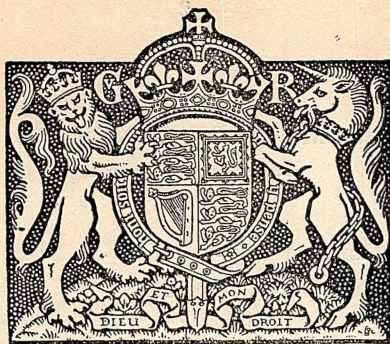
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LIST OF PREVIOUS REPORTS.

"Synopsis of Progress of Work in the Department of Civil Aviation, 1st May, 1919, to 31st October, 1919" (Cmd. 418, H.M.S.O., 2*d.*).

"Synopsis of Progress of Civil Aviation in Foreign Countries, up to 31st October, 1919" (Cmd. 476, H.M.S.O., 1*d.*).

"Half-Yearly Report on the Progress of Civil Aviation, 1st October, 1919, to 31st March, 1920" (Cmd. 800, H.M.S.O., 3*d.*).

"Half-Yearly Report on the Progress of Civil Aviation, 1st April, 1920, to 30th September, 1920" (Cmd. 1073, H.M.S.O., 4*d.*).

"Half-Yearly Report on the Progress of Civil Aviation, 1st October, 1920, to 31st March, 1921" (Cmd. 1342, H.M.S.O., 6*d.*).

"Half-Yearly Report on the Progress of Civil Aviation, 1st April, 1921, to 30th September, 1921" (Cmd. 1559, H.M.S.O., 3*s.*).

"Half-Yearly Report on the Progress of Civil Aviation, 1st October, 1921, to 31st March, 1922" (Cmd. 1710, H.M.S.O., 6*d.*).

"Annual Report on the Progress of Civil Aviation, April 1st, 1922, to March 31st, 1923" (Cmd. 1900, H.M.S.O., 9*d.* net).

"Annual Report on the Progress of Civil Aviation, April 1st, 1923, to March 31st, 1924" (Cmd. 2210, H.M.S.O., 1*s.* net).

"Annual Report on the Progress of Civil Aviation, April 1st, 1924, to March 31st, 1925" (Cmd. 2489, H.M.S.O., 2*s.* net).

TO LIEUT.-COLONEL THE RIGHT HON. SIR SAMUEL HOARE,
BART., C.M.G., M.P., SECRETARY OF STATE FOR AIR.

PART I.—GENERAL AND BRITISH EMPIRE.

RELATIONS WITH FOREIGN COUNTRIES.

International Commission for Air Navigation.

The eighth session of the permanent International Commission instituted in accordance with Article 34 of the Convention for the Regulation of Aerial Navigation (Paris, 13th October, 1919) was held in London from 3rd to 6th April and the ninth session was held in Brussels from 6th to 9th October, 1925. The usual meetings of the Technical Sub-commissions have also been held between these sessions.

One additional State, Chile, has been added during the year to the list of Contracting Parties to the Convention. The adherence of Chile took effect as from 1st January, 1926.

The Protocol of Amendment of Article 5 and the Protocol concerning an amendment of Article 34, which were adopted by the International Commission for Air Navigation at the second and fourth sessions respectively, are in each case only awaiting the ratification of one State, viz., the Kingdom of the Serbs, Croats and Slovenes, to be brought into force.

Temporary Agreements with Foreign Powers.

Provisional air traffic agreements are in force with Denmark, Holland, Norway, Sweden and Switzerland. Discussions took place with the German Government with a view to the negotiation of a provisional agreement regulating air traffic between Germany and Great Britain. A draft agreement was prepared, but it has not yet been possible to proceed to ratification. The arrangement whereby permission has been granted on a reciprocal basis, for periods of three months at a time, for the operation of British air services to Cologne and Berlin and of German aircraft to Croydon has, however, been continued.

IMPERIAL CONFERENCE.

The subject of civil air communications and operations is included in the Agenda of the Imperial Conference which is to be held in London in the coming Autumn, and it is hoped that opportunity will be found for the discussion of many important questions affecting the employment of aircraft as a factor in Empire development.

For the assistance and guidance of the Empire delegates, a detailed memorandum is being prepared by the Air Ministry, reviewing the present position of civil aviation and examining the possibilities of development within the Empire.

COMMERCIAL AIR SERVICES.

Imperial Airways, Limited.—European Services.

During the period under review the company has operated the following services :—

	Summer. (May to September.)	Winter. (October to April.)
London-Paris - - - - -	Twice daily.	Daily.
London-Paris-Basle-Zurich - - - - -	Daily.	—
London-Ostend - - - - -	Twice daily.	—
London-Brussels-Cologne - - - - -	Twice daily.	Daily.
London-Amsterdam-(Hanover-Berlin)	Daily.	Daily.
Southampton-Channel Islands - - - - -	—	Weekly.
(From 11/11/25).		

NOTE.—The section Amsterdam-Hanover-Berlin was normally operated by the Deutscher Aero Lloyd A.G., but occasionally machines of Imperial Airways Limited, operated through to Berlin. From the 23rd December to the 31st March, all the services of the Deutscher Aero Lloyd were suspended for reorganisation and there was no connection to Berlin. Connection was made at Amsterdam with a service to Copenhagen and Malmo, operated by the Swedish "A/B Aerotransport," during the summer only.

As a result of the first year's operation of the subsidy agreement with the company, it was found in practice that the mileage requirement put a premium on the employment of the small machine, the mileage for which counted the same for subsidy purposes as a machine of greater power. In order therefore to encourage the use of high-powered aircraft with a view to assisting the company to become self-supporting when the amount of the yearly subsidy decreases, it was decided to modify the agreement by substituting for the minimum annual mileage of 1,000,000 miles (required to qualify for the maximum subsidy) a new composite minimum of 425,000,000 "horse-power miles," and also by providing that for the purpose of reckoning this minimum every mile flown by a marine aircraft shall count as one mile and a half. A supplemental agreement giving effect to this modification was entered into with Imperial Airways, Limited, on 18th December, 1925.

During the year the company have completed, in accordance with the terms of their agreement, a total mileage of 810,045

and a horse-power mileage of 430,160,875, the monthly totals being :—

					<i>Mileage.</i>	<i>Horse-power Mileage.</i>
1925	April	-	-	-	72,590	35,669,700
	May	-	-	-	112,355	58,343,575
	June	-	-	-	123,100	67,218,775
	July	-	-	-	84,985	45,882,650
	August	-	-	-	82,815	44,476,550
	September	-	-	-	81,445	41,635,825
	October	-	-	-	58,350	31,239,450
	November	-	-	-	34,355	20,001,625
	December	-	-	-	29,720	16,986,750
1926	January	-	-	-	34,435	16,329,300
	February	-	-	-	40,260	21,353,900
	March	-	-	-	55,635	31,022,775
	Totals	-	-	-	810,045	430,160,875

The forthcoming summer flying season is expected to show a material increase in air traffic over previous years. In the first quarter of the year, passenger traffic on the Continental services terminating at Croydon has increased by 59 per cent. over the corresponding period of last year.

Imperial Airways, Limited, have prepared for this expansion by a considerable increase and improvement of their fleet. Four new twin-engined and one three-engined aircraft were put into service on 31st March, when the machines were christened at Croydon by Lady Maud Hoare. The company's full fleet this year will comprise :—

3	Handley Page type	W.8.B.	(seating capacity	14).
1	"	"	"	12).
1	"	"	"	14).
4	"	"	"	14).
2	Armstrong-Whitworth	" Argosy "	"	20).
1	Vickers	" Vulcan "	"	6).
2	De Havilland	D.H.50	"	4).

As compared with last year, the seating capacity of the company's fleet is increased from 119 to 178, the horse-power from 6,825 to 10,999, and the pay load from 23,000 to 37,000 lbs.

An interesting feature of the goods traffic is the total value of gold and precious metals carried by the company; this now amounts to over 10,000,000/., the bulk of which was carried during the period under review.

Further evidence of the durability of British aircraft is provided by the fact that four of the company's D.H.34 aircraft have each completed 300,000 miles in the air, while another machine of the W.8.b. type has completed 3,000 hours flying.

Imperial Airways, Limited—Egypt-India Service.

Heads of an agreement with Imperial Airways, Limited, were signed in November, 1925, for the operation with three-engined machines of a fortnightly aeroplane service between Egypt and India commencing not later than 1st January, 1927, on the understanding that the company will use its best endeavours to establish eventually and maintain a regular weekly service.

Subsidy payments up to a maximum of 93,600*l.* per annum for a period of five years will be paid to the company in respect of completed flights carried out under the agreement. In the first year of working, 1,200*l.* per flight will be paid for flights commenced at regular fortnightly intervals and completed within a maximum of five days from Cairo to Basrah, up to and including 52 such flights; 900*l.* for each flight similarly commenced and completed within a maximum of six days from Basrah to Karachi, up to and including 26 such flights; and 300*l.* for each such further flight from Basrah to Karachi, up to and including 52 in all. The normal times for the stages Cairo to Basrah and Basrah to Karachi are expected to be two to three days and two days respectively; the maximum times quoted are only for subsidy purposes. In the second and subsequent years, 900*l.* per flight will be paid for regular fortnightly flights carried out, up to and including 52 flights on each section.

A joint survey party representing the Air Ministry and Imperial Airways, Limited, went over the route from Cairo to Karachi during August and September, 1925, and arranged the preliminary organisation. A second survey party, similarly representing the Air Ministry and the company, again inspected the whole route from January to March, 1926, to arrange final details of ground organisation. The main stages of this route will be : Cairo, Gaza, Amman, Rutbah Wells, Baghdad, Basrah, Bushire, Bundar Abbas, Chahbar, and Karachi. Wireless and meteorological stations are being installed at those places where they do not already exist; the wireless and meteorological organisation is being planned in co-operation with the Royal Air Force.

The company proposes to use on this service three-engined De Havilland 66 aircraft, fitted with Bristol "Jupiter" engines.

Northern Air Lines, Limited.

Owing to financial difficulties, the service operated between Belfast and Stranraer was compelled to cease during the first three months of the period under review. From an operational standpoint the service proved successful. The operating company went into liquidation in June, 1925.

De Havilland Aircraft Company, Limited.

The De Havilland Aeroplane Hire Service has carried out a number of successful flights, including the flight of Mr. A. J. Cobham to Cape Town and back, which was made in conjunction with Imperial Airways, Limited. (This flight is referred to on

page 13.) In addition to this, many flights have been carried out for the purpose of collecting photographs for the press, from Madrid, Berlin, and other towns in Europe, and a tour has been made of Spain and Northern Africa.

School flying and air taxi flying combined amounted to an aggregate of approximately 3,000 hours during the year. The number of pupils at the company's school during the year has exceeded 140, and there is a growing proportion of pupils who intend to purchase their own aircraft.

Savage Skywriting Company.

The Savage Skywriting Company has continued operations in the United Kingdom, the United States of America and Cuba. The company has eight machines in the United Kingdom and twelve in the United States. An interesting development from the company's work has been the production by one of the pilots employed, Mr. L. M. Bramson, in co-operation with Major J. C. Savage, of the Savage-Bramson Anti-Stall gear. This instrument has proved very satisfactory on tests and is now being developed and marketed by the British Instrument Company, Limited, which was formed for this and kindred purposes.

AIR SURVEY AND PHOTOGRAPHY.

The development of aerial photography as an aid to ground survey and kindred services has continued to make progress.

An automatic film camera developed by the Royal Aircraft Establishment has been put into commercial production. It is manufactured by the Williamson Manufacturing Company, Limited, and marketed by Vickers, Limited, under the name of the "Eagle" aerial camera. Briefly, this camera is a 7-inch by 7-inch film camera taking spools of 100 exposures. It is supplied with various sizes of cones for lenses of different focal lengths. It is completely automatic in action, film travel and exposure action being electrically driven. A device is fitted whereby time and date, altitude, serial numbers and bubble levels are recorded on the film. The production of the camera marks a great improvement in the apparatus available for the reconnaissance type of air survey.

The Air Survey Committee has continued its investigations of the many technical problems involved in survey from aerial photographs, and has given advice and assistance to British commercial air survey organisations. During the period under review the Committee has produced a valuable handbook on "Graphical Methods of Plotting from Air Photographs" (H.M. Stationery Office, price 3s. net).

In Great Britain, work has been confined to the four companies who were in existence last year. The most interesting individual operation was that carried out at Eastbourne by the Aircraft Operating Company, Limited. The company obtained

a contract from the Ordnance Survey Office for the photography of fifty square miles of country, including hilly country, level ground, town and coast line, as an experiment in the revision of the large scale Ordnance Survey maps by means of aerial photography. Work is still proceeding on the plotting of these photographs, and various methods are being investigated. It is yet therefore too early to give general conclusions as to the comparative efficiency of the ground and air methods of revision of large scale maps. The results so far achieved, however, indicate that in some types of country there is a definite advantage on the side of the air method, and it has been possible to plot detail with the very high order of accuracy required.

Aerofilms, Limited, a subsidiary of the Aircraft Operating Company, Limited, obtained increased orders for miscellaneous work. Over 150 hours of photographic flying was carried out, embracing practically every county in England. Several estate agents have recognised the value of photo-maps for the development of their business. The whole of London, covering 100 square miles, has been photographed for the purpose of making a new map. Apart from the usual commercial demand, this company has executed orders for the photography of a river estuary at high and low tide, in connection with plans for the construction of dams and electrical power schemes. The Thames Conservancy Board have also used aerial photographs as a means of investigating currents in the river caused by the influx of tributaries, to assist in the preparation of plans for the construction or reconstruction of bridges.

The Air Survey Company, Limited, have continued aerial survey photography in the East. A contract for the photography of 1,350 square miles of oil-producing forest land in the Miri oil fields of Sarawak has been completed during the past year. This has involved the taking of over 2,000 photographs, from which a general map of the area on a scale of 1/50,000 and maps on a scale of 1/10,000 of the rivers are being prepared. Following on this, a further contract has been placed by the Government of Sarawak for an area of 1,760 square miles, work on which has been commenced, and an experimental order for the photography of some 400 square miles of territory has been obtained from the Government of the Federated Malay States.

The Surrey Flying Services, Limited, and the Central Aero-photo Company, Limited, have continued to carry out their normal programme of industrial photography, each company having taken over 2,000 photographs.

LIGHT AEROPLANE CLUBS.

The five Light Aeroplane Clubs to which reference was made in the last report have all been engaged in active flying operations for several months. The approval of a sixth club, provision

for which was made in the Air Ministry scheme, is still under consideration.

The De Havilland "Moth" (60 h.p. Cirrus engine) was approved for purchase by the clubs out of the equipment grant of 2,000*l.* to each club. All the clubs ordered two of these machines and one spare engine.

The total membership of the clubs is 525 flying members and 327 associate members. Up to date, nine members have obtained "A" class pilots' licences, including one lady member. It is anticipated that many more members will qualify for licences in the near future, as there are many who are now flying solo. A sum of 10*l.* in respect of each member who obtains an "A" class pilot's licence is payable by the Air Ministry to the club concerned, who may allocate a sum not exceeding 5*l.* to the member.

All the clubs employ one or more full-time instructors and a qualified ground engineer.

A total amount of 3,850*l.* of the maintenance grant has been paid to the clubs by the Air Ministry. Two machines have been "written-off" as a result of accidents, and the Air Ministry, in accordance with the agreement, will pay 50 per cent. of the cost of replacement. A few other accidents have occurred, but no injury has resulted to the occupants of the machines.

The five clubs are as follows :—

The London Aeroplane Club.

Aerodrome—Stag Lane, Edgware, Middlesex.

The machines owned by the club are three D.H. "Moths," and a fourth is being presented to the club by the Duke of Sutherland.

The Midland Aero Club.

Aerodrome—Castle Bromwich, Warwickshire.

The machines owned by this club are two D.H. "Moths."

The Lancashire Aero Club.

Aerodrome—Woodford, near Manchester.

The machines owned by the club are three D.H. "Moths" and two Avros. The third D.H. "Moth" and the two Avros were presented to the club.

The Newcastle-upon-Tyne Aero Club.

Aerodrome—Cramlington, Northumberland.

The machines owned by the club are two D.H. "Moths."

The Yorkshire Aeroplane Club.

Aerodrome—Sherburn-in-Elmet, Yorkshire.

The machine owned by this club is a D.H. "Moth." A second one is on order and delivery is expected shortly.

As an outcome of the success of the light aeroplane clubs, the number of owners of private aircraft has increased and a private owners' club has been formed to care for their interests. A further result of this success has been the formation of a light airship club, which has submitted an application to the Air Ministry for Government recognition and assistance.

TRAINING OF RESERVE OFFICERS.

New agreements continuing for a period of four years, with effect from 1st April, 1925, have been entered into with the five civil schools engaged in the instruction of Officers of the R.A.F. Reserve.

These agreements provide that each of the schools equipped with single-engined aeroplanes will carry out a minimum of 375 full training courses during the course of the four years in question and the school equipped with twin-engined aeroplanes will carry out a minimum of 280 full courses.

The following types of single-engined aeroplanes have been approved as advanced training type machines under the terms of the new agreement :—

D.H.9 (Jaguar).

Bristol Advanced Training Biplane (Jupiter).

Siddeley "Wolf" (Jaguar).

Single-engined schools which are not already equipped with these types will, it is anticipated, re-equip during the next few months.

The following statement shows the number of full courses completed at each school since the commencement of the new agreement (1st April, 1925) up to 31st March, 1926 :—

<i>Name of School.</i>	<i>Courses Completed.</i>
The De Havilland Aircraft Co., Ltd. - - - -	91
The Bristol Aeroplane Co., Ltd. - - - -	98
W. Beardmore & Co., Ltd. - - - -	81
Sir W. G. Armstrong-Whitworth Aircraft, Ltd. - - - -	83
North Sea Aerial and General Transport, Ltd.—	
Twin-engined Aeroplanes - - - -	61
Seaplanes - - - -	27
	<hr/>
Total - - - -	441
	<hr/>

The twin-engined school at Brough is equipped with Blackburn "Kangaroo" aeroplanes (two Rolls-Royce "Falcon II" engines) and the seaplane school at Brough with Blackburn "Dart" float-planes (450 h.p. Napier "Lion" engine). It is anticipated that about 100 full courses will be completed

at the seaplane school during the four years in respect of which the agreement is operative.

A scheme for the instruction of suitable candidates who require to be trained "ab initio" as pilots has been brought into practice during the year at two of the schools, and the following number of preliminary courses, which usually occupy about three months, have been completed at each :—

The De Havilland Aircraft Co., Ltd.	-	-	-	9
The Bristol Aeroplane Co., Ltd.	-	-	-	7
Total				<hr/> 16

This course involves 30 hours' flying training (dual and solo) on a preliminary training type of aircraft (Avro, De Havilland "Moth," or Bristol Preliminary Training Biplane), and at least five hours' solo flying on an advanced training type (Bristol Advanced Training Biplane, or D.H.9).

Extended lectures in air pilotage have been given by the firms' instructors to officers engaged in "ab initio" training, and an Air Ministry representative has also attended at the two schools engaged in this work for the purpose of giving special lectures on this subject.

CIVIL FLIGHT TO SOUTH AFRICA.

A flight from London to Cape Town and back was carried out between November, 1925, and March, 1926, by Mr. Alan J. Cobham, accompanied by Mr. Elliott (Engineer) and Mr. Emmott (Cinematographer). The flight was organised entirely as a commercial enterprise, without Government assistance, although Mr. Cobham had the advantage of using the aerodromes between Cairo and Cape Town which had been prepared by the Air Ministry in 1920, and in certain cases had recently been put into condition for a flight by Royal Air Force machines over this route. Mr. Cobham's purpose in undertaking the flight was primarily to survey the country traversed from the point of view of its suitability for the operation of regular air services in the future.

The flight began on November 16th and in the early stages was delayed owing to the time occupied in providing supplies of a suitable fuel along the route. Cape Town was reached on 17th February, the distance flown being 8,125 miles, divided into 27 stages.

The return journey was commenced on 26th February and completed in 15 days, on 13th March, in spite of the delay which was caused on three occasions by water-logged aerodromes, sandstorms and gales. The fact that Mr. Cobham arrived home in England before the arrival of the liner "Windsor Castle," which left Cape Town on the same day, is the more remarkable when it is considered that the route of the ship was shorter by

2,000 miles than the route followed by Mr. Cobham and that the ship steamed night and day, without interruption by climatic conditions. The route of the return flight was slightly shorter than that taken on the outward journey and consisted of 17 stages, totalling 7,980 miles.

The machine employed was a D.H.50 and was, in fact, the same machine as had been used in the previous year for the flight of approximately 18,000 miles to Rangoon and back by the Director of Civil Aviation. For the flight to Cape Town, however, it was fitted with a more powerful engine, a 385 h.p. Siddeley "Jaguar." The machine flew a further 16,000 miles approximately on the South African trip and although subjected to extremes of climate and exposure for lengthy periods on both occasions, it is still thoroughly airworthy and will be used for an attempt to fly to Australia and back.

For his services to aviation Mr. Cobham has been awarded the Air Force Cross.

It is of interest that Mr. Cobham's route across Africa followed the line of the projected Cape-Cairo railway which, for both geological and commercial reasons, is the most practicable route between north and south. It passes for half its length through the Nile Valley and on it lie some of the principal centres of population of the African continent.

AIRSHIPS.

The reconditioning of R. 33 was completed at the beginning of April, 1925, and on the 2nd of April she left the Royal Airship Works, Cardington, for Pulham, for the purpose of carrying out from that station the aerodynamic and other experiments which were an essential feature of the research programme planned by the Government as a preliminary to the construction of the two new airships.

The experiments were, however, interrupted by the break-away of R. 33 from the Pulham mast in the great gale of April 16th, 1925, which resulted in serious damage to the fore part of the airship. In spite of this damage she succeeded in weathering the storm and returning to Pulham after a flight of 30 hours, thus showing that an airship when properly handled and supplied with full meteorological information is capable of overcoming most adverse conditions.

The repair of the airship was completed in October, 1925, and the aerodynamic pressure plotting experiments, under varying conditions of flights, were then successfully carried out. Subsequently, in October and December, launching and hooking-on experiments were successfully carried out with a light aeroplane. The pressure plotting experiments should afford data, hitherto lacking, for determining the accuracy with which full scale results may be predicted from model tests, and should thus be of great value to future airship design.

In addition to the work on R. 33, progress was made with design and experimental work for R. 101. Certain preliminary constructional work is now in hand, and the main hull girders are due for delivery during the summer.

In view of the stringent need for economy it has been necessary to omit from the programme certain items originally comprised in it. The reconditioning of R. 36 is not being proceeded with, and the experimental flight to Egypt by either R. 36 or R. 33, which was planned for 1926, will not now take place. The completion of the programme will also be spread over a longer period than was originally contemplated.

Progress has been made with the Egyptian base, and both there and at Cardington the mast structures have been completed as far as the mast head. The enlargement of the Cardington shed, which has been delayed by adverse weather and other conditions, is now practically finished. When complete, the internal measurements of the shed will be:—length, 812 ft.; width, 180 ft.; height, 155 ft.

In the past year, the Airship Guarantee Company have been carrying out preliminary experimental work of various kinds. The airship R. 100 will be built at their works at Howden, Yorkshire.

EXHIBITIONS AND COMPETITIONS.

On the occasion of the second year of the British Empire Exhibition, civil aviation was even more strongly represented than in 1924, for not only was a comprehensive aeronautical exhibit displayed in H.M. Government Pavilion, but an exhibit devoted particularly to air transport was arranged in the Palace of Transport and Housing.

In the Government Pavilion a special feature was made of the history of aeronautics, which was illustrated by interesting models, pamphlets, relics, books and prints dating from the 12th century. The method of map-making and survey by air was demonstrated and this section of the exhibit was made specially interesting by the fact that the Dominions, as well as private firms, contributed. Lastly, the importance of airship development was brought before the public by various models.

In the Palace of Transport and Housing a number of aircraft and engines of Service and civil types was shown, together with an aerial lighthouse, a replica of the Croydon aerodrome control tower and many other objects of interest. It is calculated that at least a quarter of a million visitors entered the cabin of a 10-seater commercial machine that was exhibited. It was evident that visitors greatly appreciated the opportunity of inspecting aircraft at close quarters and undoubtedly this exhibit was a good means of educating the public.

In January last, an opportunity was presented for educating the rising generation. An exhibition for schoolboys was organised and the Air Ministry was asked to participate. The Air Ministry

section comprised a sectionalised aircraft engine, pictures and photographs, historical prints and relics, and a "Moth" light aeroplane. During the week in which the exhibition was open, approximately 20,000 boys were enabled to see this machine and learn how the controls of an aeroplane operate. By the courtesy of the De Havilland Company, who displayed the "Moth," a pilot was in attendance every day, answering questions and giving informatory talks.

This exhibition revealed the fact that the average boy possesses a considerable knowledge of aircraft and is only too eager to learn more if suitable facilities are afforded him.

The race for the King's Cup was held on 3rd and 4th July, and consisted of two circuits round England, a total distance of 1,608 miles. The winner, Captain F. L. Barnard, flying a Siddeley Siskin V entered by Sir Eric Geddes, attained an average speed of 131.9 miles per hour on the first day and 151 miles per hour on the second day.

A light aeroplane meeting was held at Lympne during August. Twenty-five machines were entered, all of which attended. There were five contests, the principal event being the Grosvenor Challenge Cup Handicap, which was won by a light aeroplane built privately by officers of the Royal Aircraft Establishment.

A further light aeroplane meeting will be held at Lympne from 10th to 18th September next, when a competition for two-seater light aeroplanes will take place. The principal prizes, amounting to £5,000, have been offered by the proprietors of the "Daily Mail."

Three high-speed aeroplanes were built to the order of the Air Ministry and loaned to the constructors for the purpose of competing in the Schneider Trophy Race, which was held at Baltimore, U.S.A., in October. Through a series of mishaps only one British machine actually took part in the contest. The race was won by a representative of the United States Army, at a speed of $232\frac{1}{2}$ miles per hour (approx.).

ESTIMATES, 1926-1927.

Provision for civil aviation in 1926-27 (Air Estimates, Vote 9) shows a net increase over the previous year of 104,990*l.*, due to the proposed enlargement and improvement of Croydon aerodrome and to the preliminaries for the establishment of a commercial air service between Egypt and India. The total gross provision is 473,000*l.*, offset by anticipated receipts of 11,000*l.*, giving a net expenditure of 462,000*l.* In addition, the sum of 14,467*l.* is provided for the cost of the headquarters' staff of the Directorate of Civil Aviation (Air Estimates, Vote 10).

216,500*l.* is provided for works, buildings and lands, and out of this 110,000*l.* is for the improvement of the aerodrome at Croydon, 24,000*l.* for the diversion of a public road in connection with this improvement, and 28,500*l.* for the ground accommodation required on the Egypt-India air route.

30,500*l.* is provided for the staffing and maintenance of civil aerodromes, 30,000*l.* for aerial routes, surveys, &c., and 14,000*l.* for technical equipment.

The allocation for subsidies amounts to 180,000*l.*: of this 137,000*l.* is provided for payments to Imperial Airways, Ltd., for European air services, 30,000*l.* to the same company for the Egypt-India air services, and 13,000*l.* for payments to light aeroplane clubs.

In regard to the anticipated expenditure on the reconstruction of the aerodrome at Croydon, it should be noted that increased provision is necessary owing to the fact that this work was unavoidably delayed last year, and it is hoped that considerable progress will be made during 1926.

AIR NAVIGATION REGULATIONS.

An Air Navigation (Amendment) Order, 1925, amending in certain respects the Air Navigation (Consolidation) Order, 1923, was issued on 1st January, 1926. Directions were issued in September, 1925, amending the requirements for the issue of licences for navigators, and in December, 1925, providing that certificates of inspection after overhaul of an aircraft may be given by the authorised representative of a firm approved for the purpose.*

The question of the relaxation of Air Navigation Regulations in connection with the construction and use of private aircraft has been under discussion with the Royal Aero Club, Royal Aeronautical Society, Society of British Aircraft Constructors, and other interested bodies, and the amendments to the Regulations decided upon as a result of these discussions will be issued in due course.

LICENCES AND CERTIFICATES.

The following licences and certificates were granted during the period under review :—

	<i>New Licences or Certificates issued during the year.</i>	<i>No. of Licences or Certificates current on 31.3.26.</i>
Licences for Pilots - - - -	85	207
Licences for Navigators - -	3	4
Licences for Ground Engineers -	88	361
Certificates of Registration—		
Heavier-than-Air Craft - -	104	215
Lighter-than-Air Craft - -	4	10
Certificates of Airworthiness—		
Heavier-than-Air Craft - -	111	169
Lighter-than-Air Craft - -	1	2
Licences for Aerodromes - -	136	56

* A.N.D.3E and A.N.D.3F, respectively (H.M. Stationery Office), price 2*d.* each net.

decided to install a system of ground lights consisting of sunken Neon tubes on Croydon aerodrome. Preliminary experiments to this end are in hand.

During February and March, a French company carried out a series of 10 night flights from Paris to London and return, achieving a considerable measure of regularity.

Progress has been made with the lighting of high W/T masts. The masts at Northolt, Ongar, Horsea, Rugby and Daventry have all been equipped with lights. In addition, it is proposed to install on the ground, inside the area covered by the masts, a specially designed form of Neon beacon. Only one of these is so far in operation.

The development of the Leader Cable at the Royal Aircraft Establishment has progressed satisfactorily, and arrangements are now being made for a full scale trial. If this proves satisfactory, it is intended to adopt the system at Croydon aerodrome, to be used in conjunction with the best system of Neon ground lighting.

Navigation.

Under the revised conditions for the granting of air navigators' licences (A.N.D.3E), there are now only two classes of navigators. Two examinations for 2nd class navigators have been held under this revised scheme. Examinations for both classes are held every three months, provided candidates are forthcoming. The conditions for the carriage of licensed navigators on aircraft are still the subject of discussion by the International Commission for Air Navigation. Modifications to the existing conditions will shortly be introduced. The revision of the list of instruments and navigational equipment to be carried by aircraft (A.N.D.3) is still in abeyance pending the modification of the conditions for the carriage of navigators.

With a view to enabling pilots to obtain navigators' licences, lectures on navigation and meteorology have been given at Croydon aerodrome.

Information and Maps.

The Air Ministry gazetteers of ground organisation and topographical information have been of considerable assistance to both civil and service pilots, as well as to certain foreign pilots who have asked the Air Ministry for information in connection with long flights.

Sales of the "*Air Pilot : Great Britain*," a guide to the aerodromes and conditions affecting aviation in this country, have been satisfactory, and a reprint has been necessary. Monthly supplements to this book have been issued regularly and good progress has been made by means of these supplements in consolidating and completing the information on foreign countries which was formerly contained in Notices to Airmen.

One further general sheet (Kordofan, Sudan) of the international aeronautical maps has been produced and placed on sale. The London-Paris route map is also now on sale.

Wireless Communications.

A considerable amount of traffic has been dealt with during the year under consideration. 7,655 route traffic messages (388,529 words) and 19,751 meteorological messages (352,535 words) have been passed, and 267 positions, 91 courses and 411 bearings have been given to aircraft.

Plans have been drawn up for the re-organisation of the wireless facilities at Croydon aerodrome. It is expected that this re-organisation will be completed by 1928. Extra work will devolve upon this station owing to the introduction of telegraphic working, as distinct from telephonic, for the larger types of passenger-carrying aircraft.

During the present financial year a direction-finding installation has been erected at Lympne aerodrome, and steps have been taken to modernise certain obsolete plant at the Pulham station, which works in connection with the direction finding service.

A considerable amount of work has been done in connection with the airship experimental programme, although this has not been fully effective owing to the temporary cessation of airship flying.

Arising out of the withdrawal of the British Army of the Rhine from the Cologne area, tentative arrangements have been completed whereby in the event of Cologne aerodrome becoming a German air port, the Air Ministry W/T station will be withdrawn, and a German station of a similar nature installed. Pending such a transfer the British station will remain for such a period as required by the British air service to Cologne.

The W/T stations at Castle Bromwich and Belfast have been closed.

A scheme of co-operation between the ground direction finding stations of the various western European countries has been brought into force, and it is now possible for aircraft operating on the air routes terminating at Croydon to receive direction finding assistance immediately, at any point. The countries interested in this scheme at the present time are Great Britain, France, Belgium and Holland. It is anticipated that Switzerland and several other countries will enter the scheme at an early date.

A representative of the Air Ministry visited Switzerland during September to discuss air route wireless organisation with the Swiss authorities. As a result, considerable modifications of wireless facilities are being made at the aerodromes at Basle and Zurich.

A scheme for employing direction finding apparatus on night flying aircraft is under consideration. One aircraft has been fitted with Marconi Bellini-Tosi apparatus, and with Royal Air Force

pattern "wing coil" apparatus. This machine will be operated for 50 hours during the day-time before undergoing tests at night.

Air Navigation Directions governing the carriage of wireless apparatus and operators in aircraft have been drawn up, and are expected to come into force on the 1st January, 1927. In conjunction with the General Post Office a syllabus of examination for W/T operators in commercial aircraft has been compiled and preliminary arrangements made for conducting examinations. As an experimental measure the operator in charge of the Croydon W/T station has been instructed to inspect regularly the wireless apparatus fitted on aircraft of Imperial Airways, Ltd., to ensure that the apparatus is efficiently maintained.

A wireless organisation has been drawn up for the operation of the air route between Cairo and Karachi. One contract has been placed on behalf of the Iraq Government for a $\frac{1}{2}$ kw. telegraph installation at Rutbah Wells, and three others are about to be placed for stations at Charbar, Bunder Abbas and Bushire. Wireless facilities at other points along the route will be afforded by R.A.F. stations for the time being.

Meteorological Services.

The general arrangements for the supply of meteorological information for flying on the cross-channel routes have continued on the lines of previous years. In addition to the routine issues of daily forecasts and hourly reports of actual weather on the routes, 3,725 requests for reports or forecasts were received either personally or by telephone at the terminal aerodrome at Croydon, while 2,983 reports were passed by radio-telephony from Croydon and Lympne to aircraft in flight.

Improvements in detail have been made from time to time as a result of conferences held between representatives of the meteorological services of the countries concerned. A code for the transmission of short-period forecasts by W/T, which had been tried experimentally by Great Britain and France, was adopted with slight modifications at a conference held in Brussels in October, and was brought into force on 1st November. An improved code for reporting line-squalls and thunderstorms was adopted at the same conference, and brought into use on 1st January, 1926.

Special arrangements were made during January and February in connection with a series of night flights between Croydon and Le Bourget.

The general arrangements for the supply of meteorological information on the Southampton-Guernsey route are those which were in force prior to the temporary closing of the route on 1st March, 1925, reports and forecasts being issued to the operating company by the meteorologist-in-charge at the R.A.F. Base, Calshot.

For the Stranraer-Belfast route the meteorological arrangements detailed in last year's report were maintained until the

8th June, when the service was suspended. The meteorological station at Belfast was closed on the 4th December.

A second meteorological station was closed during the year, that at Castle Bromwich. In view of the cessation of reports from this station, arrangements were made with Sir W. G. Armstrong-Whitworth Aircraft, Limited, for weather reports to be supplied from the aerodrome at Whitley Abbey, Coventry, in connection with flying in the Midlands.

A system of special reports and forecasts was organised in connection with the King's Cup Race in July and the Light Aeroplane Meeting at Lympne in August, and a statement of the average weather conditions at Baltimore, U.S.A., was prepared in connection with the Schneider Cup Race. Other work carried out during the year included :—

Reports on the meteorological conditions affecting civil aviation over the routes (i) Cairo to Karachi, (ii) Frederikshavn to Stockholm, and (iii) Cairo to Cape Town.

Special observations at Croydon of horizontal visibility on foggy nights in connection with tests of certain lights.

Forecasts for night flying operations which were carried out at Lympne in connection with the work of the R.E. Acoustical Section at Hythe.

Steady progress has been made with the investigation of meteorological conditions along the proposed England-Egypt-India airship route and at proposed airship bases, and numerous inquiries have been answered in connection with wind and climatological conditions affecting airships. A study of wind structure in relation to airship design and mooring is being undertaken at Cardington.

A proposed meteorological organisation for this route has been drawn up and discussion of details is proceeding. In this connection a visit has been made to Malta, Egypt, Italy and France to survey the existing resources and investigate the additions which will be necessary.

MEDICAL SERVICES.

All questions relating to the medical aspects of civil aviation, including the examination of civil pilots, are now dealt with under the supervision of the Director of Medical Services, Royal Air Force.

The examinations for class "B" (public transport) licences continue to give satisfactory results; the civil pilot has now the additional advantage of appearing before a Board of specialists for his medical examination, whilst full benefit of the experience gained from medical research in connection with Royal Air Force personnel is also secured.

The year under review shows a considerable proportional increase in the number of medical examinations carried out for class "A" (private) licences. This is due largely to the

establishment of Light Aeroplane Clubs. The year 1925, in fact, shows the highest number of both "A" and "B" licences issued since 1920.

It cannot be doubted that the high standard of physical fitness maintained by public transport pilots is one of the governing factors in the safety of the regular air lines.

TECHNICAL DEVELOPMENT.

GENERAL.

The development of outstanding interest which has occurred during the period under review has been Senor de la Cierva's invention of the "Autogyro" (now known as the "Gyroplane"), which was successfully demonstrated at the Royal Aircraft Establishment. This type of aircraft obtains its lift, not by the conventional fixed wings, but by a set of four planes revolving about an axis set almost in a vertical position. These planes are not driven by the engine, but the aerodynamical forces operative in flight are such that a substantially constant speed of rotation is maintained. In the aircraft tested this speed was 140 r.p.m.

The machine is not a helicopter in that it does not rise vertically in still air, but it is characterised by a very low landing speed following a glide at a steep angle of descent. The aircraft tested showed a rate of descent of 15 ft./sec., gliding into a wind of less than 5 m.p.h. at an angle of 30° to the horizontal.

The aircraft is easy to fly and capable of the ordinary manoeuvres. The lack of stability and control usually associated with rotating wings is overcome by hinging the planes so that they are free to move up and down in a manner analogous to the flapping flight of birds.

Further tests of this promising invention are being undertaken. Its value for the purposes of civil aviation cannot at present be satisfactorily estimated.

The Wireless Beacon is being developed as an aid to aerial navigation, to assist pilots in finding the aerodrome on an established air route, even when the ground is obscured by cloud or fog. A wireless signal is transmitted from the aerodrome and affects a receiver in the aircraft in such a manner that it enables the pilot to steer directly on to the transmitting station. Relying on this device, the pilot may leave his route in order to avoid storms or physical obstacles and return accurately to the course at any time that he desires to do so. In conjunction with the Leader cable and Neon lights the beacon forms a systematic scheme of navigation by which the pilot can guide himself from a distance to the aerodrome with the maximum degree of accuracy. Two of these beacons are now under test.

As already mentioned, a successful series of experiments with Neon lights were carried out at Croydon during the months when atmospheric conditions are normally at their worst.

Anti-Stall Gear.—This device has been designed with the object of preventing the most common cause of aircraft accidents, *i.e.*, the “stall,” and is still in the experimental stage. The apparatus consists of a cylinder and piston coupled to the control column of the aircraft in such a way that when compressed air from a suitable reservoir is admitted behind the piston, a distinct pressure is applied to the column in a forward direction. The supply of compressed air to the cylinder is controlled by a valve operated by a vane mounted on an interplane strut near the fuselage. In practice, the pressure applied is such that the warning cannot pass unnoticed, but it is so adjusted that the pilot can easily overcome it should he so desire.

The problem of the prevention of “stalling” has also been attacked by the use of wing flaps and slotted wings and by the adoption of planes of special sections, of which a public demonstration was given in April, 1925, with results the success and importance of which were immediately apparent.

Gyro Rudder Control.—This apparatus, which is designed to relieve the pilot from strain in the effort to keep an aircraft on its course during a long flight, is being tested on three experimental commercial aircraft and one transport machine, the property of Imperial Airways, Ltd. It consists essentially of a gyro wheel, a compressed air reservoir and two cylinders and pistons, the latter being connected to a false rudder bar, which again is connected to the main rudder bar. As the aircraft turns, the gyro operates the false rudder bar, which causes the rudder to move in opposition to the turn, thus bringing the aircraft back to its course. A development of this system, on which experiments are being conducted, combines both the aileron and rudder control.

Metal Construction.—Further progress has been made with metal construction for civil aircraft, but no machines built by this method of manufacture have yet been completed.

ENGINES.

The radial air-cooled engine, developing an average of 400 h.p., has been extensively developed and it is now fitted to several types of commercial aircraft. Two noteworthy examples of the high standard of efficiency and reliability attained by these engines have been provided by the fine performance of the Siddeley “Jaguar” engine used by Mr. Alan J. Cobham in the trying climatic conditions of flight between England and the Cape, and the flying test carried out between Croydon and Bristol with a machine fitted with a Bristol “Jupiter” engine, during which time approximately 25,000 miles were flown, the engine

being sealed throughout the test and no adjustments or replacements being made.

The experimental tests of sleeve-valve systems have been extended to air-cooled engines with considerable success.

The development of the 650 h.p. water-cooled engine has now reached the commercial stage, and this engine has been fitted to some of the latest types of passenger-carrying aircraft.

The heavy oil engine is still in the experimental stage. The system adopted has been embodied in complete engines which have arrived at the point of undergoing bench tests.

AIRCRAFT.

Air Ministry Experimental Aircraft.

The following are particulars of civil types of landplanes and seaplanes which have been built or are in process of design or construction to the order of the Air Ministry :—

Landplanes.

Handley Page "Hamilton."—The 3-engined Handley Page machine known as the "Hamilton" has now been purchased by Imperial Airways, Ltd., and forms a part of their regular fleet.

Avro "Andover."—This machine, which was built originally as a Service type and later was converted for experimental use in air transport, has carried out a certain number of tests which have now been discontinued. The main object of testing this machine on commercial lines was to try-out the Rolls-Royce "Condor" engine of 650 h.p. with which she was equipped. By the time her first tests were completed, a machine which had been built specially for commercial purposes and which also was fitted with a "Condor" engine had become available; hence it was decided to discontinue further experiments with the "Andover."

Vickers "Vanguard."—This machine, which is fitted with two Rolls-Royce "Condor" engines and has accommodation for 21 passengers, has a maximum speed of 115 miles per hour, her paying load being 3,800 lbs. A preliminary operational test has been carried out with Imperial Airways, Ltd., and the machine has now been fitted with gyro rudder control, automatic aileron control, Bellini-Tosi directional wireless and wing coils, in preparation for a further period of test with the company.

European Transport Types.—Of the two machines mentioned under this heading in last year's report, the De Havilland "High-clere," or D.H. 54, which is fitted with a Rolls-Royce "Condor" engine, has undergone satisfactorily her preliminary tests. She is an extremely controllable machine, has a good range of speed and an excellent climb. Gyro rudder control, automatic aileron control and various types of experimental wireless equipment are now being fitted to the machine and she will be handed over to

Imperial Airways, Ltd., to undergo a period of test under commercial operating conditions.

Progress is being made by Handley Page, Ltd., in the construction of a small 3-engined aeroplane fitted with three Bristol "Lucifer" engines and this machine will be flying during the coming year.

Middle-East Transport Types.—One of the two machines mentioned in last year's report has been completed. This machine, built by Sir W. G. Armstrong-Whitworth Aircraft, Ltd., and known as the "Argosy," has undergone preliminary makers' trials and will shortly proceed to the Experimental Establishment, where she will undergo full flying trials. From experience so far gained, she shows an excellent performance, and is likely to prove a decided advance as regards performance for air transport purposes. She is largely of metal construction. Imperial Airways, Ltd., have ordered two machines of this type for use on their European services.

Beardmore 3-engined Monoplane.—This machine, which is a large, 3-engined, all-metal cantilever monoplane, is still under construction. It is hoped that she will be flying during this year.

Freight Carrier.—Progress has been made in the design of the freight carrier carrying a paying load of $8\frac{1}{4}$ lbs. per h.p.

Seaplanes.

Supermarine "Swan."—The "Swan," which was originally designed as a boat amphibian to be equipped with two Rolls-Royce "Eagle IX" engines, later was fitted with Napier "Lions" and the amphibian gear was removed. She is now in process of being handed over to Imperial Airways, Ltd., to undergo a flying test on the route between Southampton and the Channel Islands. Her official type tests showed her to have an excellent performance. She has been modified to carry passengers and goods, and is equipped with electric lighting and wireless apparatus.

Saunders "Medina."—This small short-stage boat seaplane, which is being built by S. E. Saunders, Ltd., was originally to have been fitted with two Siddeley "Lynx" engines, but is now to be equipped with two Bristol "Jupiter" engines. It is expected that she will be flying during the forthcoming summer. She has comfortable cabin accommodation for either six or eight passengers, together with two compartments, one for stowing baggage and the other for mails.

All-Metal Seaplane.—The large sea-going boat seaplane to which reference was made in last year's report will not be built. In her stead an all-metal boat seaplane fitted with three Bristol "Jupiter" engines is under consideration.

Fairey "Freemantle."—This machine, of the float seaplane type, fitted with one Rolls-Royce "Condor" engine, was originally intended for long-distance work, and was in consequence fitted

with special wireless installation. She will be used for purposes outside the regular passenger-carrying service.

Other New Types of Aircraft.

The following aeroplanes and seaplanes of civil types have been built by manufacturers in addition to the Air Ministry types abovementioned :—

Handley Page "Hampstead."—This machine, built to the order of Imperial Airways, Limited, is fitted with three Siddeley "Jaguar" engines. She has accommodation for 16 passengers and, so far as the limited experience with her shows, has an excellent performance. She climbs well and is considerably faster than the older type Handley Page machines.

Handley Page W. 10.—As mentioned earlier in the report, four machines of this type have been acquired by Imperial Airways, Limited. The W. 10 follows to a great extent the lines of the earlier W. 8B type, but it is fitted with two Napier "Lion" engines developing a total of 900 h.p. The machine is designed to carry 14 passengers. Provision is made for heating the cabin, warm air entering at floor level, whilst ventilation is obtained by the use of tubes fitted above the windows. Differential aileron control is installed. The cruising speed of the machine is in the region of 90 miles per hour.

D.H. "Moth."—An interesting machine which has been widely used during the past year is the De Havilland "Moth." This is a 2-seater aeroplane fitted with a 60-h.p. "Cirrus" engine. She is light and easy to handle, has an excellent performance and, owing to the simplicity of the engine, can easily be maintained by any individual who is capable of carrying out running repairs to a motor-car. A large number of these machines have been supplied to Light Aeroplane Clubs and private owners, and a certain number have been exported to the Dominions.

Short "Cockle."—An interesting type of small all-metal boat seaplane, known as the "Cockle," has been built by Short Bros., Limited. This aircraft is fitted with two Blackburn 18-h.p. air-cooled engines placed in the wings close to the hull. The machine, which is of monoplane construction, has a maximum speed of 62 miles per hour and a landing speed of 38 miles per hour, and is undergoing tests at Felixstowe.

INVESTIGATION OF ACCIDENTS TO CIVIL AIRCRAFT.

BRITISH AIRCRAFT.

From a "safety first" point of view, the progress of civil aviation in this country has been most satisfactory.

During the period under review no aircraft belonging to Imperial Airways, Limited, met with a serious accident, that is,

an accident to which Air Navigation (Investigation of Accidents) Regulations, 1922, are applicable, and no fare-paying passenger was injured in any aircraft registered in the British Isles.

There were only five accidents which called for notification under the above regulations, and not one had serious consequences beyond damage to the aircraft. All occurred during the last four months of the period. In two cases the aircraft were being tested preparatory to short passenger-flights (joy rides), and in each of the remaining three cases the aircraft belonged to and was being flown by a member of a Light Aeroplane Club.

Causes of Accidents.

Each of the accidents in question was, in the opinion of the Inspector of Accidents, due solely to an error of judgment on the part of the pilot.

The circumstances which led to the accidents were briefly as follows :—

1. Short Passenger Flights.

(1) The pilot choked his engine on taking-off, and while he was endeavouring to readjust the mixture the aeroplane struck a tree and crashed to the ground. The pilot and the two passengers (non-paying) sustained slight facial injuries.

(2) On leaving the ground the pilot started a climbing turn to the right, but at a height of about 50 ft. the aeroplane stalled. The machine then fell to the ground out of control and was completely wrecked. The pilot and one of the two passengers (non-paying) were injured, but not seriously.

2. Light Aeroplane Clubs.

(1) An error of judgment on the part of the pilot, when attempting to land at the conclusion of his third solo flight, caused the aeroplane to strike the ground heavily. The undercarriage collapsed and consequently the machine was badly damaged, but the pilot escaped injury.

(2) In this case also, the pilot misjudged a landing and the aeroplane, after striking the top of a hedge bordering the aerodrome, crashed to the ground. The pilot, who was the only occupant of the machine, was unhurt.

(3) The pilot accidentally stalled the machine when gliding at a low height preparatory to landing on the aerodrome. Failing to recover completely from the resulting dive, the aeroplane struck the ground nose first and turned over. The pilot, a lady, who was on her first solo flight, escaped injury.

FOREIGN AIRCRAFT.

Only one serious accident to foreign aircraft occurred in this country during the period under review. This involved a French

machine employed on the cross-Channel route and unfortunately resulted in loss of life.

The circumstances were as follows :—

On a journey from Paris to London the pilot encountered thick mist over the North Downs and the weather conditions became so bad that he attempted to land. The aeroplane, however, struck a tree and crashed to the ground. Of the seven passengers, one was killed, one was seriously injured, and one was slightly injured, the remainder being unhurt. The pilot and mechanic also escaped injury.

STATISTICS OF CIVIL FLYING.

Statistical tables are given on pages 31–36. The following is a summary of the principal facts revealed by these tables :—

Table A.—British Air Transport (Part I of the table) showed an increase in the number of passengers carried as compared with the previous year, despite the fact that slightly less mileage was flown. Whilst passengers increased from 13,478 to 14,675, mileage decreased from 890,000 to 865,000. This is an indication of the more economical operation that is being brought about by the use of larger aircraft. The weight of cargo transported amounted to 456·1 tons, which is less than the previous year but an increase over any earlier year.

It should be understood that for the purpose of simplifying the calculation of passenger traffic the number is counted of passengers travelling over each single stage. An individual flying over two or more stages is therefore counted more than once according to the number of stages flown.

Other flying for hire or reward (Part II of the table), which consists mainly of “ joy-ride ” flying, again showed a remarkable increase and the number of passengers carried during the year in this branch of aviation was the largest on record—67,329. The previous largest total was 66,785 for the boom period from May, 1919, to 31st March, 1920, following the reopening of civil aviation after the war.

In the seven years' period covered by the table, 67,227 passengers and 1,804·7 tons of cargo have been carried in air transport flying and 315,102 passengers in other flying for hire or reward.

The number of “ joy ride ” passengers is actually higher than the table shows, since certain operators have not rendered returns, particularly during the past year.

Table B. compares British with foreign traffic to and from the Continent only. The most noteworthy point about this table is that the total cross-Channel passenger traffic has continued to increase uninterruptedly from year to year. In the year under review passengers carried across the Channel

numbered 11,163 by British aircraft and 10,391 by foreign aircraft, a total of 21,554, of which the British share represents 52 per cent.

Table C.—The value of goods imported and exported by air (by British and foreign aircraft combined) also sets a new high record. The combined imports and exports of general merchandise reached £1,972,972 as against £1,328,395 in the previous year. Bullion and specie, which are not included in this table, are being conveyed by air in rapidly increasing quantities. During the year under review the value carried totalled £11,328,829, of which exports formed the largest part, viz., £11,140,589. The lower insurance rates for air transport as compared with ordinary transport are particularly favourable to such freight as precious metals.

Table D. indicates the efficiency of the British air transport services on the basis of flights completed without interruption. Out of 4,179 flights commenced, 3,888, or 93 per cent., were uninterrupted and a further 148 were completed on the same day after interruption. Only 143, or 3·4 per cent., were not completed on the same day. This result compares fairly closely with that of the previous year, when 94 per cent. of flights commenced were uninterrupted and 3·7 per cent. were not completed on the same day.

Table E.—Involuntary landings on regular air transport services are again shown to be attributable to weather in about 50 per cent. of cases and to engine or installation failure in about 33 per cent. of cases. Landings caused by weather are due in the main to poor visibility, and this table thus emphasises the importance of the work that is in progress with the Leader cable, Neon lights and other aids to flying when visibility is unfavourable.

Table F.—This table illustrates the very satisfactory position that has been attained with regard to freedom from accidents. In the past year *no accident resulting in death or injury occurred in either air transport flying or other flying for hire.*

Since 1919, air transport flying amounting to 4,563,000 miles has now been carried out with only four accidents causing the death of passengers. This is equivalent to one such accident in a distance flown corresponding to 46 times round the equator.

Other flying for hire has maintained its freedom from fatal accident for the fourth successive year.

TABLE A.

BRITISH CIVIL AVIATION.

(May, 1919, to March, 1926, inclusive.)

Period.	PART I.					PART II.		
	Air Transport (Internal and Continental).					Other Flying.*		
	Machine Flights.	Machine Mileage.	Passengers carried.	Cargo carried.	(Tons.)	Machine Flights.	Machine Mileage.	Passengers carried.
April, 1925	-	-	-	-	-	2,518	12,000	5,011
May "	406	84,000	1,144	28.3	41.7	3,290	16,000	9,236
June "	612	122,000	1,951	41.7	50.0	3,737	19,000	7,226
July "	700	137,000	2,640	50.0	59.7	4,433	24,000	8,359
August "	491	90,000	1,937	39.7	47.7	5,670	29,000	12,295
September "	453	86,000	2,005	48.5	50.5	4,118	20,000	8,312
October "	434	87,000	1,580	50.5	50.5	3,342	15,000	6,029
November "	306	62,000	967	40.5	40.5	1,759	10,000	3,038
December "	182	35,000	409	31.2	31.2	583	3,000	928
January, 1926	163	30,000	354	23.9	23.9	782	5,000	1,358
February "	199	35,000	384	20.6	33.5	1,573	9,000	2,363
March "	213	40,000	435	33.5	-	1,628	7,000	3,174
Total, year ending 31st March, 1926	4,461	865,000	14,675	456.1	-	33,433	169,000	67,329
Total, year ending :-	-	-	-	-	-	-	-	-
31st March, 1925	4,677	890,000	13,478	508.0	-	23,519	139,000	43,766
31st March, 1924	5,012	1,004,000	15,913	427.1	-	22,842	120,000	39,227
31st March, 1923	4,000	778,000	11,460	216.4	-	13,578	109,000	25,253
31st March, 1922	1,156	259,000	5,692	26.6	-	21,767	234,000	36,048
31st March, 1921	2,641	599,000	5,754	124.5	-	23,513	302,000	36,694
†31st March, 1920	754	168,000	1,155	46.0	-	37,067	524,000	66,785
Total : May, 1919, to March, 1926	22,701	4,563,000	67,227	1,804.7	-	175,719	1,597,000	315,102

* In Part II. of this table the figures subsequent to March, 1922, refer to flights for hire or reward other than air transport flights and thus consist almost entirely of joy riding. The figures for the previous three independent periods include all flying other than regular air transport. Based on returns for 1922, about 91 per cent. of the flying shown in Part II. previous to April, 1922, would have been flying for hire or reward.

The statistics of "other flying" are compiled from returns rendered voluntarily by the various firms; some firms, however, have not rendered returns and the total amount of "other flying," particularly in the past year, was therefore more than that shown above.

† Air Transport (Part I.) commenced in August, 1919, and Other Flying (Part II.) in May, 1919.

TABLE C.
VALUE OF GOODS (a) IMPORTED INTO THE UNITED KINGDOM BY AIRCRAFT; (b) EXPORTED AND RE-EXPORTED FROM THE UNITED KINGDOM BY AIRCRAFT.
(August, 1919, to March, 1926, inclusive.)

Period.	Imports from					Exports and Re-exports to				
	Belgium	France.	Nether-lands.	Other Countries.	Total.	Belgium.	France.	Nether-lands.	Other Countries.	Total.
April, 1925	£ 3,373	56,062	£ 2,001	7,291	£ 68,727	£ 474	17,150	£ 2,364	£ 5,211	£ 25,199
May "	3,683	74,077	2,859	38,092	118,711	359	15,798	1,205	9,902	27,264
June "	2,694	66,756	2,111	80,419	151,980	747	27,182	3,658	39,723	71,310
July "	4,677	66,588	2,611	104,221	178,097	755	23,347	2,413	16,143	42,658
August "	264	69,706	2,837	2,821	75,628	209	7,833	2,278	7,171	17,491
September "	661	126,205	4,124	4,764	135,754	281	11,095	1,007	8,962	21,345
October "	2,633	146,879	3,031	7,411	159,954	508	28,754	4,619	13,976	47,857
November "	2,035	80,183	3,681	9,651	95,550	1,337	30,078	2,495	5,063	38,973
December "	2,843	57,456	9,322	2,529	72,150	280	27,056	1,894	4,966	34,196
January, 1926	3,073	38,346	5,338	2,840	49,597	248	30,657	2,241	843	33,989
February "	2,764	43,394	1,383	717	48,258	20	150,002	2,319	658	152,999
March "	6,800	79,309	2,600	3,788	92,497	910	209,053	1,749	1,076	212,788
Total, year ending 31st March, 1926	35,500	904,961	41,898	264,544	1,246,903	6,128	578,005	28,242	113,694	726,069
Total, year ending—										
31st March, 1925	14,892	709,528	34,055	82,628	841,103	16,020	326,801	27,272	117,199	487,292
31st March, 1924	2,909	489,378	34,225	78,058	604,570	4,970	182,819	28,371	62,503	278,663
31st March, 1923	3,651	445,488	45,106	3,877	498,122	7,837	225,144	31,373	1,318	265,672
31st March, 1922	4,583	325,417	8,471	560	339,031	3,535	178,759	19,741	948	202,983
31st March, 1921	4,453	665,099	2,178	10,579	682,309	26,570	260,954	44,210	4,297	336,031
31st March, 1920 (7 months)	391	135,248	471	6	136,116	9,583	57,161	—	1	66,745
Total : August, 1919, to March, 1926	66,379	3,675,119	166,404	440,252	4,348,154	74,643	1,809,643	179,209	299,960	2,363,455

NOTE.—Bullion and specie are excluded. Imports and exports of bullion and specie in year ending 31st March, 1926, amounted to :—
Imports £188,240; Exports £11,140,589; Total £11,328,829.

TABLE D.
EFFICIENCY OF BRITISH SUBSIDISED AIR SERVICES.
(April, 1925, to March, 1926.)

Period.	Flights over single stages.				Percentage completed uninterrupted.
	Total commenced.	Completed same day uninterrupted.	Completed same day after interruption.	Not completed same day.	
April, 1925	361	351	5	5	98
May, "	579	563	10	6	97
June, "	639	620	15	4	98
July, "	461	420	23	18	92
August, "	420	384	22	14	91
September, "	409	389	11	9	95
October, "	284	252	20	12	89
November, "	180	155	10	15	86
December, "	159	135	7	17	86
January, 1926	187	149	12	26	80
February, "	211	192	8	11	91
March, "	289	278	5	6	96
Total, April, 1925-March, 1926	4,179	3,888	148	143	93
Total, April, 1924-March, 1925	4,328	4,064	105	159	94

TABLE E.
CAUSES OF INVOLUNTARY LANDINGS IN RESPECT OF FLIGHTS BY BRITISH SUBSIDISED AIR SERVICES.
(April, 1925, to March, 1926.)

Period.	Total flights commenced.	Cause of landing.				Percentage of total landings.			Percentage of total flights commenced, interrupted, all causes.
		Weather.	Engine or installation failure.	Other reasons.	Total.	Weather.	Engine or installation failure.	Other reasons.	
April, 1925, to September, 1925 -	2,869	66	66	24	156	Per cent. 42	Per cent. 42	Per cent. 16	Per cent. 5
October, 1925, to March, 1926 -	1,310	103	42	25	170	60	25	15	13
Total (12 months) : April, 1925, to March, 1926.	4,179	169	108	49	326	52	33	15	8
Total : April, 1924, to March, 1925	4,328	144	96	46	286	50	34	16	7

NOTES.—(1) Landings for petrol or oil are not included.

(2) Table D accounts for 291 interrupted flights during April, 1925–March, 1926, whereas Table E above gives the causes of 326 interruptions over the same period. This difference is due to the fact that on 27 stage flights there were two interruptions and on 4 stage flights three interruptions.

TABLE F.
ACCIDENTS: CIVIL AVIATION.
(May, 1919, to March, 1926, inclusive.)

	May, 1919, to March, 1920.		April, 1920, to March, 1921.		April, 1921, to March, 1922.		April, 1922, to March, 1923.		April, 1923, to March, 1924.		April, 1924, to March, 1925.		April, 1925, to March, 1926.	
	Air Trans- port.	Other Fly- ing.	Air Trans- port.	Other Fly- ing.	Air Trans- port.	Other Fly- ing.	Air Trans- port.	Other Flying for Hire.	Air Trans- port.	Other Flying for Hire.	Air Trans- port.	Other Flying for Hire.	Air Trans- port.	Other Flying for Hire.
Passengers killed -	1	—	2	7	1	1	—	No accidents	3	—	7	—	No accidents	No accidents
Passengers injured -	2	—	2	1	2	2	—	death or injury.	—	—	—	—	death or injury.	death or injury.
Passenger flights per passenger killed -	1,155	—	2,877	5,242	37,408	18,704	11,460	No accidents	5,004	—	1,925	—	No accidents	No accidents
Passenger flights per passenger injured -	580	7,420	2,877	36,694	18,704	18,704	11,460	death or injury.	—	—	—	43,766	death or injury.	death or injury.
Crew killed -	2	2	2	3	2	2	2	No accidents	—	—	—	—	No accidents	No accidents
Crew injured -	1	9	—	6	4	4	1	death or injury.	2	1	1	1	death or injury.	death or injury.
No. of accidents involving casualties:—														
Fatal -	2	2	1	3	2	2	1	No accidents	1	—	1	—	No accidents	No accidents
Non-fatal, but resulting in injury to occupants -	—	11	1	6	4	4	1	death or injury.	2	1	—	1	death or injury.	death or injury.
Approximate machine miles per accident resulting in death or injury to occupants -	84,000	40,000	299,000	34,000	39,000	39,000	389,000	No accidents	335,000	120,000	890,000	139,000	No accidents	No accidents
Machines flights per accident resulting in death or injury to occupants -	377	2,851	1,320	2,612	3,628	3,628	2,000	death or injury.	1,671	22,800	4,677	23,519	No accidents	No accidents

NOTES.—(1) The numbers of crew carried are not available.

(2) For the period, May, 1919–March, 1922, other flying includes all flying other than air transport or competitive flying.
For the period, April, 1922–March, 1926, other flying is flying for hire or reward other than air transport or competitive flying.

(3) For details of accidents during 12 months, April, 1925–March, 1926, *vide* pages 27–29.

THE DOMINIONS AND COLONIES.

AUSTRALIA.

The length of routes over which regular services were in operation at the commencement of 1925 totalled approximately 2,810 miles. This has now been increased to 3,270 miles. In addition some 1,400 miles of new routes have now been prepared. The following notes and the table on the next page indicate the progress being made on the regular services :—

Perth-Derby (1,442 miles).

Operated by the Western Australian Airways, Ltd., since 5th December, 1921. An extension from Derby to Wyndham is to commence shortly. Passengers (carried over single stages) increased from 774 in 1924 to 1,056 in 1925; goods traffic from 6,460 lbs. to 12,809 lbs.

Charleville-Cloncurry-Camooweal (825 miles).

Operated by the Queensland and Northern Territory Aerial Services, Ltd., since 2nd November, 1922. The new stage Cloncurry-Camooweal has made it possible to travel from Charleville to Camooweal by air in $2\frac{1}{2}$ days as against 7 days by other transport. Passengers (carried over single stages) increased from 698 in 1924 to 1,142 in 1925 and goods from 4,825 lbs. to 13,154 lbs. The company has acquired manufacturing rights to build D.H. 50 machines.

Adelaide-Cootamundra (578 miles); *Mildura-Broken Hill* (189 miles); *Melbourne-Hay* (233 miles).

Operated by the Larkin Aircraft Supply Co., Ltd., who previously operated the Adelaide-Sydney service. Opened on the 21st July, 1925. During the $5\frac{1}{2}$ months ending 31st December, 1925, the service carried 197 passengers (over single stages) and 5,038 letters. In 1924, on the Adelaide-Sydney route, the number of letters carried during a period of 7 months was 2,360. The maximum subsidy payable for these services is £29,576 per annum, with possible reductions on 21st July, 1926, to £27,729 per annum, and on 21st July, 1927, a possible further reduction to £24,032 per annum.

Following the example set in Great Britain, the Australian Government has decided to assist the formation of a number of light aeroplane clubs, and two clubs have been approved, at Sydney and Melbourne respectively. The Government will loan to each club two De Havilland "Moth" aeroplanes, two spare engines and assorted spare parts, for a period of two years, and will have a further "Moth" available for each club during the first year as replacement equipment should one of the "Moths" loaned originally be destroyed or seriously damaged.

AUSTRALIAN REGULAR AIR SERVICES, 1925.

Service and Period.	No. of flights.	Miles flown.	Hours flown.	Passengers carried per single stages.	Letters carried.	Goods carried.	Remarks.
Perth-Derby 1/1/25-31/12/25.	989 *(3,180)	154,024 (542,741)	2,128 (7,191)	1,056 (2,731)	233,902 (631,632)	Lbs. 12,809 (27,027)	* Figures in brackets are figures since inception of Service 5/12/21-31/12/25.
Charleville-Camooweal— 1/1/25-31/12/25.	820 †(2,207)	83,888 (215,990)	1,057 (2,810)	1,142 (2,333)	19,126 (45,826)	13,154 (22,010)	† Figures in brackets are figures since inception of Service 2/11/22-31/12/25.
Adelaide-Cootamundra. Broken Hill-Mildura. Melbourne-Hay. 21/7/25-31/12/25.	591	70,042	885	197	5,038	23	
Adelaide-Sydney. 1/1/25-14/7/25.	289 ‡(653)	44,893 (93,605)	554 (1,165)	§112	1,354 (3,714)	12 (72)	‡ Figures in brackets are figures from inception of Service 2/6/24 until 14/7/25, when service stopped. § No passengers were carried from 2/6/24-31/12/24.
TOTAL, 1925 -	2,689	352,847	4,624	2,507	259,420	25,998	
GRAND TOTAL -	6,631	922,378	12,051	5,373	686,210	49,132	

In addition, the Government will give free use of Government aerodromes, free hangar and workshop facilities, club-room accommodation at a reasonable rental, part-time services of a resident Ground Engineer, free medical examinations of prospective pupils, and for every pupil who qualifies for the private pilot's licence a bonus of £20 will be paid.

It is hoped that the clubs will be able to commence flying by May or June next.

There is considered to be a large scope for light aeroplanes in Australia and it is believed that a considerable demand would be found immediately for a light aeroplane costing a little less than the types at present available.

During 1925 several reconnaissances of possible future routes were made including—

- (a) An aerial inspection between Melbourne (Victoria) and Launceston (Tasmania);
- (b) A ground survey of the country between Brisbane and Charleville (Queensland);
- (c) A ground survey of the country between Rockhampton and Longreach (Queensland).

CANADA.

Development of civil aviation in Canada has continued to take an upward trend, the main stimulus being the increasing demands for forest protection and aerial photography.

It is significant that the three railways laying lines into the Rouyn Gold Fields in North Western Quebec have each used air surveying methods on the preliminary location. Last autumn, the Canadian Pacific Railway had a photographic survey made for an extension of its line from Angliers into Rouyn. The whole of the Abitibi Southern Railway's line, from Arios on the National Transcontinental, south-eastward across the upper waters of the Ottawa River, to Maniwaki and Mont Laurier, was also surveyed by air, while the Canadian National Railways have had a reconnaissance made of a line running southwards from O'Brien.

During 1925, the Government had 33 aircraft of the Royal Canadian Air Force available for civil operations, and the fact that work for thirteen branches of the Government service was included in the programme for the year is a remarkable indication of the extent to which aviation is assisting in the development of Canadian resources.

Financial limitations forced the postponement of some operations, while in other cases lack of suitable equipment and adverse weather made their execution impossible. As in the past, work for the Dominion Forest Service was the largest single item of the 1925 programme, and out of a total flying time on civil operations of 2,443 hours, 1,347 hours were flown on this work.

During the season there was much wet weather, and the number of patrols and consequent hours of flying were lower

than would be the case in a normal season. This, combined with haze and smoke in Alberta, reduced the photographic programme too. It had been confidently expected that an area of about 70,000 square miles could be photographed in Western Canada with the three aircraft available during the season. Because of unfavourable weather and, to a lesser extent, camera failure on one or two occasions, only 47,000 square miles were covered—in Manitoba, 38,000 square miles; in Alberta, 8,600 square miles; in Nova Scotia, 225 square miles; and from Ottawa, 1,140 square miles.

The third largest item on the programme was fishery protection work, which was carried out on a much more extensive scale than in previous years. A total of approximately 300 hours' flying was done on this work, chiefly from a sub-base established at Prince Rupert.

One other operation requires special mention, that is the participation of the R.C.A.F. in the investigation being carried out by the Department of Agriculture and the Honorary Advisory Council for Scientific and Industrial Research into the spread of the wheat rust disease over the prairie provinces in the late summer. This experiment was the outcome of the satisfactory results obtained in previous years in searching the upper atmosphere for wind-borne spores of the white pine blister rust disease on the Pacific Coast. Owing to the pressure of other operations, it was not possible to devote an aeroplane specially to this work, but arrangements were made for forest patrol and photographic machines working in the prairie provinces to expose specially prepared glass slides during the course of their normal flights for other work.

In addition to the civil work done by the Royal Canadian Air Force, the Province of Ontario operated nineteen flying boats, which carried out 2,739 hours of flying on forest fire protection, forest survey, etc. Detailed type mapping from the air by sketching was carried out over 6,000 square miles, and oblique photographs of 500 square miles were taken to control and supplement the sketching. The flying boats were available for all branches of the Ontario Government requiring transportation in the remoter parts of the country. In connection with the discovery of a mineral field at Red Lake, news of which arrived too late in the year to enable supplies to be taken up by canoe, five flying boats were employed by the Provincial Department of Mines to assist in the transportation of supplies, and 15 tons were carried by air from the railway to Red Lake, some 125 miles to the north.

In the province of Quebec the necessary air work is carried out by private contractors. The Dominion Aerial Exploration Company, operating from Roberval, in 1925 carried out preliminary reconnaissance over 25,000 square miles and sketching over 5,900 square miles. Vertical photography to supplement and control the sketching was carried out over 125 square miles.

In addition, the Fairchild Aerial Survey Company, operating from Oscalaneo, carried out reconnaissance over about 1,000 square miles, with photography over 110 square miles.

The Laurentide Air Service, Limited, after four years of commercial flying, has decided, for a variety of reasons, to suspend operations. During its life the company has flown 300,000 miles, has inaugurated the first aerial mail express and transportation service in Canada, and has not injured a single passenger or lost a pound of merchandise.

A new company, the Northern Air Service Syndicate, commenced operations on the Haileybury-Rouyn route on 14th May, 1925. Contracts are being made to land men and supplies at various points over an extensive mining area.

The firm of Brock & Weymouth, Inc., of Philadelphia, U.S.A., have developed and patented a method of making contoured maps from air photographs, and have established a Canadian branch, which was responsible for the air survey work in connection with the extension of the Canadian National Railways into the Rouyn Mining Area.

SOUTH AFRICA.

The experimental air mail service operated for a period of three months by the Union Air Force over the route Cape Town-Durban proved highly satisfactory as a demonstration of the degree of regularity attainable, although the traffic forthcoming failed to come up to expectations.

As a result of this experiment the Union Government decided to find a small annual subsidy for a commercial service. The amount offered was, however, considered inadequate by British companies and, in the absence of suitable British proposals, the Union Government entered into negotiations with a group in South Africa, who proposed to employ Junkers' machines, for the establishment of an air service between Cape Town, Durban and Johannesburg. A subsidy of 8,000*l.* per annum was offered to this group, and it was stipulated that the service should from its inception be operated with South African personnel. These negotiations have now broken down, and there is still a possibility of a British scheme being adopted.

The flight to Cape Town by Mr. Alan J. Cobham did much to arouse interest in civil aviation, and has improved the prospects of launching an air transport scheme with success.

BRITISH GUIANA.

The Real Daylight Balata Estates, Ltd., who bought a seaplane for the purpose of conveying fever patients from up-country plantations to Georgetown Hospital, carried out a number of special duties during the year.

On two occasions the machine was chartered to carry out an exchange of Government wireless operators at the W/T station at Apoteri. In both cases the relief was taken up and the sick operator brought down to Georgetown Hospital. It was also twice chartered by the Local Government, once when the seaplane was required to photograph the flooded coast, embracing an area approximately 20 miles long by two miles wide, and again when an aerial survey was needed of the lower reaches of the Essequibo River. From February to the beginning of November the machine made 54 flights, occupying 70 hours of flying time.

PART II.—FOREIGN COUNTRIES.

EUROPE.

[The accompanying plate shows the air lines of Europe, N. Africa and the Middle East in 1926.]

AUSTRIA.

The Oesterreichische Luftverkehrs A.G. of Vienna, which has been in existence since 1923, operated the following services during 1925 :—

(1) *Vienna-Budapest.*

(2) *Vienna-Munich-Nuremburg*, having connection with Leipzig and Berlin, and also with the routes Munich-Zurich-Geneva and Munich-Frankfurt. Operated for the third successive year in conjunction with Junkers' Trans-Europa Union.

(3) *Vienna-Klagenfurt.* A new service which was opened on 17/5/25, and operated during the summer three times per week in each direction.

(4) *Vienna*, via Linz, to the Lakes in the *Salzkammergut*. A new service operated during the summer season.

In addition to the regular air traffic a number of special flights, including flights for taking photographs and making cartographic surveys, were carried out. The following statistics for 1925 include internal traffic and traffic with the nearest foreign air ports carried out by both the Austrian company and all foreign air traffic companies operating over Austrian territory :—

<i>No. of Flights.</i>	<i>Total distance flown.</i>	<i>Passengers carried.</i>	<i>Goods carried.</i>
3,551	555,452 miles.	6,210	243 kgs.

Compared with 1924 there were increases of 75 per cent. in the number of flights, 70 per cent. in the distance flown, 100 per

cent. in the number of passengers carried and 180 per cent. in the weight of goods transported. No accident of any serious nature occurred during 1925.

The two most important flying schools in Austria are the flying school at Aspern, conducted by the Oesterreichische Luftverkers A.G., and the school at Vienna which the "Avis" Aircraft and Motor Works opened during 1925.

An aeronautical agreement between Austria and Germany has been concluded, and a new draft law for the regulation of air traffic undertakings in Austria has been drawn up.

BELGIUM.

By a decree dated 26th August, 1925, the administration of civil aviation was transferred from the Ministry of National Defence to the Ministry of Railways, Marine, Posts and Telegraphs.

The S.A.B.E.N.A. (Société Anonyme Belge d'Exploitation de la Navigation Aérienne) continued its service throughout last summer between Amsterdam-Rotterdam-Brussels-Basle. It is not yet decided whether this service will be resumed this year.

The first section of the company's Belgian Congo line, Kinshasa-Bandundu-Ilebo-Luebo, was opened on 25th April, 1925, with six Handley Page W.8.f. and three D.H. 50 machines. One Handley Page machine was flown out from Belgium, arriving in the Congo on 3rd April, 1925. The second section, from Luebo to N'Gule (Katanga), was opened on 12th February, 1926. Intermediary landings are made on this section at Kanda-Kanda and Bukama.

The service is proving very successful. During the first seven months of its operation, 221 passengers were carried, in addition to approximately 16 tons of mail and $1\frac{3}{4}$ tons of goods. A remarkable saving of time has been accomplished. The Katanga has been brought within three days (instead of 45) of Leopoldville, the capital, and as a connection is made between the European mail boats, local railways and the air line, it is possible for Elizabethville (Katanga) to be reached in 23 days from Brussels entirely by Belgian means of transport. It is proposed to extend the line from Kinshasa to Boma this year.

CZECHOSLOVAKIA.

The State air line Prague-Bratislava-Kosice was recommenced on 1st March, 1925, the service being daily in each direction. A more or less regular service was also operated during the year between Prague and Marienbad by the "Aero" Factory.

A National Air Transport Company was constituted on 28th March, 1925, amongst the founders being the principal aircraft constructors and several banks. D.H.50 machines

manufactured by the "Avia" factory under licence, are to be used, and it is hoped to start operations in the Spring of 1926. The share capital is fixed at 9½ million kronen, and the company will receive a subsidy of not less amount than that given by Czechoslovakia to the French C.I.D.N.A.

The Aircraft Operating Company, Limited, of London, carried out negotiations with the Czechoslovak Government with a view to undertaking the organisation of Czechoslovak air transport in conjunction with the national company. There is every reason to hope that a satisfactory arrangement will be arrived at in the near future.

Two new agreements have been concluded between Czechoslovakia and France (*see under France*), and an agreement has been signed between Czechoslovakia and Italy for the development of an air line between the two countries. Agreements between Czechoslovakia on the one part and Germany, Poland and Hungary on the other part are under consideration. An Air Law was passed on 8th July, 1925.

DENMARK.

The Danske Luftfartselskab recommenced operations on 20th April, 1925, when the Copenhagen-Hamburg and Copenhagen-Berlin services were reopened in conjunction with the Deutsche Aero Lloyd. During the period of operation the traffic carried out by the two companies totalled :—

168,588 miles flown;
1,400 passengers carried;
24·8 tons goods and mails.

Of these totals, the Danish company's share was :—

79,273 miles flown;
766 passengers carried;
13·9 tons goods and mails carried.

The proposed co-operation of the company with the Swedish company A/B Aerotransport in the operation of the Malmö-Copenhagen-Hamburg-Amsterdam service had to be abandoned owing to the unsuitability of the Malmö aerodrome for the Danish company's Dornier machines. The Danske Luftfartselskab consequently operated an additional service to Hamburg from July 15th to October 1st, there connecting with the Dutch K.L.M. services to London and Paris.

During August and September, the Danske Luftfartselskab ran an experimental service to Amsterdam, linking up with the line of the Société General des Transports Aériens to Paris. For this experiment the Farman company loaned one of its Farman-Jabiru 4-engined aeroplanes and, as a result, the Danish company has decided to adopt this type, the licence being acquired for construction in Denmark. It is proposed to establish a regular service with Paris in April, 1926.

The negotiations between the Danish Government and the Copenhagen Municipality with regard to the grant of a subsidy by the latter body to the Danske Luftfartselskab have been satisfactorily concluded. The company will now receive, for a period of four years, an annual subsidy of 100,000 kroner in addition to the Government subsidy.

No services were operated by the Danske Luftransport, which was formed early in 1925 as a subsidiary of the Junkers company.

FINLAND.

The Finnska Aerobolag has applied to the Finnish Government for a loan of F.mk. 2,500,000 in order to assist in the purchase of a large Junkers seaplane for the operation of a line Stockholm-Abo-Helsingfors.

The sum of F.mk. 300,000 is set aside in the 1926 Finnish Budget for the subsidising of an air mail service.

Results on the Helsingfors-Reval and Helsingfors-Stockholm routes from 1/6/25 to 1/9/25 were as follows :—

	<i>Passengers.</i>	<i>Letters.</i>	<i>Newspapers and Goods.</i>
		lbs.	lbs.
Helsingfors-Reval (operated by the Finnska Aerobolag in conjunction with the Esthonian "Aeronaut" Company).	653	340	1,942
Helsingfors-Stockholm (operated by the Finnska Aerobolag in conjunction with the Swedish A/B Aerotransport).	436	748	3,610

FRANCE.

The financial vote for the Under-Secretariat for Aeronautics and Air Transport in 1925 was 152,581,700 francs, as compared with 138,463,350 francs in 1924. The amount allocated for subsidies was 57,210,000 francs, as against 46,922,000 francs in 1924. The estimates for 1926, not yet passed, amount to a total of 152,575,000 francs, with 61,350,000 included for subsidies.

The Compagnie Internationale de Navigation Aérienne—C.I.D.N.A. (formerly Cie. Franco-Roumaine)—operated their trans-European line as far as Bucharest and also the line to Warsaw. Negotiations with Turkey for an extension from Bucharest to Constantinople were continued and brought to a satisfactory conclusion. The situation brought about through the refusal of the German Government to permit the passage of French machines across Germany in the absence of an agreement

seriously affected the reliability of the company's service. The route across Switzerland and Austria which the company were obliged to take proved extremely difficult to operate. The services recommenced this year on 15th February, the extension to Constantinople being opened on 17th March. Pending the satisfactory conclusion of the negotiations with Germany, now proceeding at Paris, there is no connection between Paris and Prague.

The scheme of the Compagnie Générale d'Entreprises Aéronautiques (Latécoère) for a service to South America is progressing. The Toulouse-Casablanca service was extended on 1st June, 1925, to Dakar, with a weekly service in each direction between Casablanca and Dakar, in the first place for goods and mails only. Intermediary landings are made at Agadir, Cape Juby, Villa Cisneros, Port Etienne and Saint Louis. The length of this extension is approximately 1,780 miles, and the total length of the company's system is now 3,780 miles.

A sister company, named the "Companhia Brasileira de Empreendimentos Aeronauticos," has been formed in Brazil for the exploitation of the South American section of the line. The Brazilian Government has granted this concern a 60-year concession for a service between Recife and Pelotas, with possible extension to Natal, Fernando de Noronha and St. Paul's Rocks. The service is to be weekly and is to be commenced within two years. An agreement is also being drawn up with Argentina for the extension of the line to Buenos Aires. The section from Dakar to Brazil is to be carried out by fast steamer.

The Cie. Générale d'Entreprises Aéronautiques also inaugurated a seaplane line between Alicante and Algiers, but this branch was subsequently suspended.

The following table shows the rapid growth in transport of mails by this company :—

	<i>No. of Letters.</i>					
1919 - - - - -	-	-	-	-	-	9,124
1920 - - - - -	-	-	-	-	-	182,061
1921 - - - - -	-	-	-	-	-	327,805
1922 - - - - -	-	-	-	-	-	1,407,352
1923 - - - - -	-	-	-	-	-	2,958,863
1924 - - - - -	-	-	-	-	-	4,026,593
1925 - - - - -	-	-	-	-	-	7,502,191

The remaining French air lines have continued to operate regularly, namely :—

Paris-London, by l'Air Union.

Paris-Amsterdam, by Société Générale de Transports Aériens.

Antibes-Ajaccio, by Cie. Aeronavale.

It is the intention of l'Air Union to extend its activities toward the East by means of seaplane services across the Mediterranean. With this object in view, l'Air Union is effecting an amalgamation with the Cie. Aeronavale. In 1926, the company will extend

its London-Paris line to Lyons and Marseilles and simultaneously the base of the Antibes-Ajaccio seaplane line will be moved from Antibes to Marseilles.

The following table illustrates the continuous growth of French air traffic :—

	1923.	1924.	1925.
Miles flown (approx.) - - -	2,115,000	2,249,000	2,946,000
Passengers carried, by stage	7,811	16,277	19,768
Goods and mail carried (approx.) tons - - -	778	1,515	1,810

The French Government, in accordance with its previous practice, again offered in 1925 and is offering in 1926 substantial prizes to French constructors who succeed in regaining or retaining the world's principal air records. Amongst other competitions held in France during the year 1925 were the following :—

Competition.	Prizes.	Donors.
Engine endurance competition.	2,600,000 francs.	1,600,000 francs by the French U.S. of S. for Aeronautics. 1,000,000 francs by the Comité français de propagande Aéronautique.
Transport Seaplane competition.	1,000,000 francs.	French U.S. of S. for Aeronautics.
Touring aircraft competition.	300,000 francs.	Ditto.
Michelin Cup - - - -	Bronze replica and 20,000 francs.	MM. Michelin.
Beaumont Cup - - -	Objet d'art (valued 25,000 frs.) and 75,000 francs.	Louis D. Beaumont.
Société du Carburateur Solex Prize.	50,000 francs.	Société du Carburateur Solex.
Vauville glider and light aeroplane meeting.	100,000 francs.	U.S. of S. for Aeronautics, Department of La Manche and Town of Cherbourg.

Two new agreements were signed between France and Czechoslovakia on 26th May, 1925. One refers to the subsidisation of the commercial air lines between the two countries carried out by the C.I.D.N.A. In this agreement, which is of 10 years' duration, the rates and conditions of subsidy to be paid by both Governments are laid down. The second agreement deals with collaboration in technical matters between the two countries and provides *inter alia* for an exchange of technical personnel and of manufacturing licences between the two States.

GERMANY.

The following sums were set aside by the Reich Government in the 1925-26 Budget for civil aviation purposes :—

Service.	Gold Marks.
1. Wireless on aerodromes- - - - -	160,000
2. Exhibitions, cost of preparation, prizes, &c. -	3,582,000
3. Meteorology, including contribution towards maintenance of kite station at Friedrichshafen. (Investigation of the upper air) -	142,000
4. Research—encouragement of - - - -	4,870,000
5. Contribution towards maintenance of Adlershof Experimental Station - - - -	850,000
6. Subsidies for air traffic - - - - -	6,700,000
7. Subsidies for ensuring the security of aerial traffic, &c. - - - - -	4,000,000
8. Gliders and low-powered aircraft - - - -	3,600,000
9. Contribution towards maintenance of Göttingen Experimental Station - - - -	250,000
10. Contribution towards maintenance of aeronautical museums - - - - -	3,500
	<hr/> 24,157,500
	Approx. (£1,207,875)

In addition to the above, considerable financial assistance for air transport was again forthcoming from State Governments and numerous local authorities. This assistance took various forms—subsidies for local air lines, provision of aerodromes and investments in aerodrome and air transport companies. The provision of aerodromes or assistance of aerodrome schemes by municipal authorities has become a particular feature of German civil aviation.

In view of the considerable development of aviation that is taking place it has been decided to re-organise the present "Reichverkehrsministerium" (German Ministry of Transport) in order that the air transport branch ("Luftverkehrsabteilung") may in future be a separate and distinct department.

The two big groups controlled respectively by Deutscher Aero Lloyd A.G. and Junkers Luftverkehrs A.G., were again responsible for practically all air transport activity and together operated 42 day services and 2 experimental night services.

Official statistics of the traffic carried out are not available, but the following figures which have been published in the German

press give some idea of the enormous increase which has taken place during the last three years :—

	<i>Goods carried.</i>	<i>Passengers carried.</i>
1923 - - -	1,000 kilos.	5,000
1924 - - -	30,000 „	25,000
1925 - - -	900,000 „	127,000

Important changes in organisation based upon an amalgamation of the Deutsche Aero Lloyd and Junkers groups are in progress.

The Junkers scheme for bringing all its associated companies into an organisation to be known as the “Europa Union,” mentioned in the last report, was proceeded with and in May, 1925, a company of that name was duly registered. In the autumn of 1925, however, German air transport was faced with a financial crisis and the German Ministry of Transport introduced a plan for the amalgamation of the Junkers Luftverkehr A.G. with the Deutsche Aero Lloyd A.G. Negotiations between the two companies ensued and in January, 1926, arrangements for the complete amalgamation of the two concerns, as well as the independent air transport companies, were decided upon. In order that preliminary work for the 1926 flying season might begin a provisional organisation was formed under the name of “Deutsche Luft Hansa A.G.”

In addition to the capital which is being provided by the Junkers and Aero Lloyd groups, the Reich, various States and the local air traffic companies will take shares in the new company. As a means of stimulating local interest, the local companies will retain their separate identities, but certain amalgamations may be arranged amongst themselves. The Deutsche Luft Hansa A.G. is purely a transport company, the Junkers constructional company (Junkers Flugzeugwerke A.G.) remaining entirely separate.

All German air traffic was suspended on 23rd December, 1925, and, after preliminary reorganisation, will resume on 1st April, 1926, with the operation of the following lines :—

1. Berlin—Hanover—Amsterdam—Ostend—London.
2. Berlin—Danzig—Königsberg—Tilsit—Memel.
3. Malmo—Copenhagen—Berlin—Dresden.
4. Berlin—Leipzig—Nuremberg—Munich.
5. Zurich—Munich—Vienna—Budapest.
6. Munich—Innsbruck.
7. Basle — Mannheim — Frankfurt on Main — Cologne — Düsseldorf—Amsterdam.
8. Zurich — Stuttgart — Mannheim — Frankfurt on Main — Hanover—Hamburg.
- 8a. Essen—Mulheim—Dortmund—Frankfurt on Main.
9. Malmo—Copenhagen—Hamburg—Bremen—Amsterdam.
10. Hamburg—Bremen—Dortmund—Essen—Düsseldorf—Cologne.

11. Rotterdam-Essen-Dortmund.
12. Stettin-Kalmar-Stockholm.
13. Dortmund-Essen-Cologne-Frankfort on Main-Munich.
14. Berlin-Halle-Munich.
15. Berlin-Halle-Erfurt-Stuttgart-Zurich.
16. Berlin-Magdeburg-Cologne.
17. Berlin-Halle-Erfurt-Frankfort on Main-Mannheim-Karlsruhe.
18. Berlin-Breslau.
19. Gleiwitz-Breslau-Halle-Cologne.
20. Breslau-Gorlitz-Dresden-Leipzig-Halle.
21. Dortmund-Cassel-Halle-Leipzig.
22. Dusseldorf - Crefeld - Munchen Gladbach - Essen - Dortmund-Brunswick-Berlin.
23. Flensburg-Kiel-Hamburg.
24. Danzig-Marienburg-Elbing-Allenstein.
25. Stettin-Schwerin-Hamburg.
26. Stettin-Stolp-Danzig.
27. Stettin-Berlin.
28. Stettin-Swinemunde-Stralsund.
29. Frankfort on Main-Giessen-Cassel.
30. Hamburg-Berlin.
31. Hamburg-Magdeburg-Halle-Leipzig-Dresden.
32. Bremen-Hanover-Brunswick-Leipzig-Chemnitz.
33. Dresden-Chemnitz-Plauen-Nuremberg.
34. Mannheim-Karlsruhe-Baden-Villingen-Constanz.
35. Munich-Reichenhall.
36. Munich-Baden Baden-Mannheim-Darmstadt.
37. Plauen-Gera-Halle.
38. Basle-Stuttgart-Nuremberg.
39. Berlin-Danzig-Konigsberg-Kovno-Smolensk-Moscow.

One of the important features of the new programme is the introduction of night flying on the Berlin-Moscow route. By starting from Berlin at 2 a.m. it is hoped to reach Moscow in the afternoon of the same day and the return journey will be similarly accelerated.

The training of pilots in Germany is now divided into two sections—training for certificate “A” (for private, photographic, advertising and exhibition pilots) and training for certificate “B” (for commercial transport pilots). Training for certificate “A” is carried out by various commercial schools and also by the “Sportsflug” schools and affiliated societies of the Deutsche Luftfahrtverband. Training for certificate “B” is carried out by the new “Verkehrsfiegerschule” at Staaken, Berlin, which both Junkers and the Deutsche Aero Lloyd helped to found. Only pupils who already hold certificate “A” are admitted to this school.

The “Deutsche Rundflug” competition, mentioned in the last report, commenced on 31st May, 1925, and was a great success. There was an entry of 81 machines, of which 50 per

cent. were new types specially designed. The competition was spread over 10 days and consisted of five circular flights of about 700 miles each, commencing and finishing at Berlin.

An important seaplane competition organised by the Deutsche Luftfahrtverband will take place during 1926.

Provisional air navigation agreements have been concluded between Germany and Sweden and between Germany and Austria.

HOLLAND.

The following services were operated by the K.L.M. during 1925 :—

Amsterdam-Rotterdam-London.

Amsterdam-Rotterdam-Paris.

Rotterdam-Amsterdam-Hamburg-Bremen-Copenhagen.

This service was opened on 20th April, 1925, and was operated in conjunction with the Danish company, Danske Luftfartselskab.

Rotterdam-Dortmund (Experimental service, opened 13th July, 1925).

Amsterdam-Rotterdam (Experimental service, opened 31st October, 1925).

The traffic carried out by Dutch aircraft amounted to :—

679,753 miles flown ;

5,051 passengers carried ;

225 tons goods and mails carried.

The company has modernised and increased its fleet of aircraft, replacing the Fokker F.III's (Rolls-Royce engine) with Fokker F.VII's (Bristol Jupiter engine).

In view of the fact that the subsidy agreement with the Government expires at the end of 1926, the company has applied for the grant of a new subsidy, amounting to 4,000,000 florins, spread over a period from 1927 up to and including 1934, by which time it is expected air traffic will have become self-supporting.

Increasing interest is being given to a scheme for air transport in the Netherlands East Indies, and the K.L.M. is keeping such a scheme at the forefront of its plans for expansion.

A new Dutch company—"Wereld Luchvaart Verkeer Maatschappij"—was formed in 1925 under the auspices of the Junkers company and operated a service Amsterdam-Essen-Berlin.

Provisional air navigation agreements were concluded by Holland with Switzerland, Sweden, Norway and Poland.

ITALY.

The civil aviation estimates for 1925-26 amounted to 26,000,000 lire ; of this amount 16,000,000 lire has been actually voted. A

number of schemes for air lines are in preparation, the position of which is as follows :—

Rome - Brindisi - Athens - Constantinople. (Societa Aero-Expresso Italiana).—Owing to difficulties in the way of establishing a seaplane station at Constantinople, the opening of this line has been much delayed. An agreement with the Turkish Government has now been reached, and it is hoped to commence the service this summer.

Turin - Trieste (Societa Italiana Servizi Aerei).—Agreements signed and test flights made. Service to commence this Spring.

Rome - Genoa - Barcelona (Societa Anonima Navigazione Aerea).—Held up pending an agreement between Italy and France.

Rome - Palermo (Societa Anonima Navigazione Aerea).—To be operated temporarily until the Rome-Genoa-Barcelona service is started.

Rome - Cagliari.—Tenders called for.

Between 21st April and 7th November, 1925, the Marchese di Pinedo, Chief of Staff in the Italian Air Ministry, accompanied by a mechanic, made a flight of approximately 30,000 miles in a Savoia seaplane from Italy to Australia and Japan, and back.

Aviation groups have been formed at several Universities, and a Federation of these groups has been constituted.

The airship N.1 ("Norge") has been sold by the Italian Government to Roald Amundsen for an attempt to reach the North Pole and explore the polar region this year. Col. Nobile, designer of the airship, will act as pilot, and a number of Italians will be included in the crew. (*See also under NORWAY.*)

JUGO-SLAVIA.

The Jugo-Slav Aero Club ("Nasa Krila"—"Our Wings") is considering the establishment of an air transport company for the operation of an air line from Belgrade to Zagreb.

It is proposed that at a later date connections will be established between Belgrade and Laybach, Sarajevo, Uskub and Monastir, and also between Cetinje and Podgoritsa.

NORWAY.

The Norwegian Ministry of Defence has included in its estimates for 1926-27 a sum of 44,400 kroners for civil aviation, against 14,400 kroners for 1925-26.

No regular air transport services were operated in Norway during the period under review. A company entitled "A/S Aerotransport" has been formed, with the object of operating a service between Oslo and Malmo, in conjunction with the Swedish company, A/B Aerotransport. The company is also planning a service between Trondhjem and Tromso.

Another company, "Norsk Lufttrafik Aktieselskab," was formed in October, 1925, to carry out propaganda and passenger flights.

A provisional air traffic agreement has been concluded between Norway and Holland.

Roald Amundsen, who in May, 1925, made an attempt to reach the North Pole by aeroplane, is making a further attempt this year with an airship acquired from the Italian Government.

NOTE.—The "Norge," the airship in question, after having flown from Rome to Spitzbergen *via* Pulham, Oslo and Leningrad, left Spitzbergen on May 11th and crossed the Polar regions to Teller, Alaska, covering 2,450 miles in 71 hours.

POLAND.

The "Polski Aerolot" operated its usual services between Warsaw-Danzig, Warsaw-Lemberg, Warsaw-Cracow and Cracow-Lemberg. In addition, an experimental service from Cracow to Vienna was run from 27th April.

The "Polski Aerolot" hopes to open very shortly a service between Danzig and Copenhagen. A conference was held between Poland, Denmark and Sweden in March, 1925, when the establishment of this service was agreed upon, and trial flights were carried out last August.

The following statistics show the growth of traffic since 1922 on the lines operated by the company:—

	1922.	1923.	1924.	1925.
Miles flown - - -	66,293	142,057	233,923	465,847
Passengers carried - -	659	2,089	2,791	5,394
Goods carried (tons) -	9.2	12.3	29.7	74.1
Mail " " -	.29	.39	.64	1.34

A regular service was operated by the Aero Company, Posen, between Warsaw and Posen from 23rd May, 1925, to 20th January, 1926, on which date the service was suspended indefinitely. Farman F.70 machines were used.

An agreement relative to air traffic between Poland and the Netherlands was signed on 4th November, 1925.

ROUMANIA.

To encourage enterprises connected with national defence, the Roumanian Government passed a law on 25th June, 1925, authorising State participation in the formation of an aircraft manufacturing concern. As a result, a company has been formed at Bucharest, known as the Roumanian Aeronautical Company ("Industria Aeronautica Romana"), with a capital of 120 million lei.

A French group, comprising the firms of Lorraine-Dietrich and Bleriot have contributed 40 million lei of the capital, and the

remainder has been subscribed partly by the State, partly by the Astra Company of Arad, and partly by public subscription, various banks having taken an interest.

Flying recommenced last September on the State air mail service between Bucharest and Galatz. A passenger service will probably be started this Spring.

SOVIET RUSSIA.

The "Deruluft" operated the Konigsberg-Kovno-Smolensk-Moscow service for the fourth successive year, and between 1st May, 1925, and 31st October, 1925, the company's machines covered a total distance of 292,595 miles and carried 1,741 passengers and approximately 60 tons of freight and mails. Five minor accidents occurred, and an average regularity of 95 per cent. was maintained. The reduction of freight rates by 25 per cent. and of passenger rates by 50 per cent. caused a large increase of traffic as compared with previous years.

The "Ukrvozdchput" operated regular services, three times per week, during the summer on the following routes :—

- (1) Moscow-Kharkoff-Rostoff.
- (2) Kiev-Kharkoff.
- (3) Kharkoff-Odessa.

Owing to the success of these lines, it is proposed to operate daily services in the near future, and an extension of the Moscow-Kharkoff-Rostoff line to Tiflis and Baku is planned.

The "Dobroliot" reorganised its services in January, 1925, and operated the following routes during the year :—

- (1) Pishpek-Alma-Ata (irregular service).
- (2) Bokhara-Khiva, later extended to Teschaus (three times weekly).
- (3) Bokhara-Dushambe (proposed extension to Kuliaba) (three times weekly).

In 1926, the "Dobroliot" proposes to organise lines between the Aldan gold fields and the Amur railway and between Irkutsk and Yakutsk, and, in addition, agreements have been drawn up for the operation of services to the northerly fur depôts. The company also proposes to undertake air photography and survey.

The "Zakavia" Company is proposing to operate a line between Tiflis and Tabriz during 1926.

The use of seaplanes for the observation of ice in the Kara Sea during 1925 was so successful that it is anticipated that, in future, charts furnished by this means will render the use of ice-breakers unnecessary.

On 10th June, 1925, six machines left Moscow to carry out a flight to Pekin. Four machines arrived at Pekin on 13th July and a fifth on 17th July. The expedition was then divided into two sections. Two out of three machines which set off for Shanghai arrived at their destination on 20th August, and one

of the other two machines succeeded in reaching Tokio on 2nd September. Further long-distance flights are planned for 1926.

During 1925, the Society of Friends of the Air Fleet combined with the "Dobrokhim" (Volunteer Chemical Society), the combined society being known as the "Aviokhim." In April, 1925, the Society of Friends of the Air Fleet had a membership of 2,400,000 and had collected 4,821,278 roubles, of which 3,235,093 had been expended on aeroplane construction. "Dobrokhim" had at the time of the union 1,300,000 members, a considerable number of whom already belonged to the Society of Friends of the Air Fleet. Branches of the Society have been opened at Berlin, Hamburg and Kabul.

SPAIN.

Commandante Franco, accompanied by two other officers and a mechanic, accomplished a flight of 6,290 miles from Spain to Buenos Aires, using a Dornier-Wal flying-boat, fitted with two British Napier "Lion" engines.

The engines were in excellent condition on the completion of the flight, and Commandante Franco spoke highly of their performance.

SWEDEN.

An air traffic subsidy agreement on the general lines of the scheme outlined by the Swedish Cabinet and referred to in the last Annual Report was concluded between the Government and the Aerotransport A/B on 12th June, 1925. Brief particulars of the subsidy paid are as follows :—

Malmo-Copenhagen-Hamburg-Amsterdam route.

In 1925, a subsidy of Kr. 1.75 per flight kilometre for six round journeys per week during the period 22nd May to 30th September. In the event of a Danish company participating in the service the Swedish company shall be subsidised for three round journeys per week at the rate of Kr. 2.10 per flight kilometre. During the year 1926, the subsidy shall be paid for a period of 5½ months and during each of the years 1927 and 1928 for a period of 6 months.

Stockholm-Helsingfors route.

Subject to an approved Finnish company carrying out half the number of journeys, a subsidy shall be paid at the rate of Kr. 1.50 per flight kilometre during the period 22nd May to 31st August, 1925, and for a period of 4 months in each of the years 1926, 1927 and 1928.

Oslo-Gothenburg-Copenhagen-Malmo route.

Subject to an approved Norwegian aircraft operating half the number of flights, and a direct connection with Hamburg being

effected at Copenhagen, a subsidy at the rate of 1.50 kr. per flight kilometre shall be paid for a period of three months during each of the years 1926, 1927 and 1928.

If, in consequence of a reduction in prices for materials or requisites necessary for the company's service the subsidy is found to be too high, the Government is empowered to reduce the subsidy by not more than 25 per cent.

In addition to the kilometric subsidies a sum of 500,000 kr. has been allocated to an Air Traffic Loan Fund to assist the company in the purchase of material.

The Stockholm-Helsingfors, Malmo-Hamburg-Amsterdam and Malmo-Copenhagen services were resumed by the company on 13th May, 1925, without awaiting the Government's decision with regard to subsidies, and were carried on until the end of the subsidy period for the year. The proposed co-operation with the Danish company, Danske Luftfartselskab, on the Malmo-Copenhagen service was found impracticable and A/B Aerotransport therefore operated this service independently. As regards the Oslo-Gothenburg-Copenhagen-Malmo service, the Norwegian company, Norsk Lufttrafik A/S, was unable to participate and consequently the Copenhagen-Oslo section was not operated.

From 1st October to 22nd December, after the expiration of the subsidy period, a service was operated by the company between Malmo and Hamburg, for which it received a special postal subsidy of 150 kroner per flight. During approximately the same period, the company also operated a service on the route Malmo-Berlin-Dresden, for which it was paid a special postal subsidy of 50 kroners per flight carrying mails, and during September it operated an experimental service for the carriage of fish between Stockholm and Gothenburg.

The capital of A/B Aerotransport has been increased to Kr. 666,000 and the company's fleet now consists of 4 three-engined and 6 single-engined machines; of the three-engined machines two were purchased with the assistance of the State Aviation Loan Fund. Twelve Swedish pilots are employed. The report of the company for 1925 gives the following figures of traffic carried out:—

248,610 miles flown;

10,026 passengers carried;

55.1 tons goods and mails carried.

A new company, entitled "Nordiska Flygrederiet," was formed in May, 1925, and on 5th June opened a service between Stockholm and Danzig. This service, which was at first operated on alternate days, proved so successful that from 19th June a daily service was operated until 1st October. At Danzig, connection was made with Berlin. From 3rd September the island of Gothland was included in the route, by an intermediary landing at Visby. Dornier seaplanes fitted with Rolls-Royce engines were used.

Altogether, 176 flights were carried out and 516 passengers conveyed. It is proposed to replace this service in 1926 by a service Stockholm-Stettin. The Nordiska Flygrederiet has two additional services under consideration, Oslo-Gothenburg-Copenhagen-Hamburg and Gothenburg-Esbjerg-Norderney-London (*viâ* Harwich). An application made to the Swedish Government for a subsidy in respect of these services has, however, been refused.

The A/B Flygindustri (constructional company allied to A/B Aerotransport), whose formation was announced in the last report, has made rapid progress. By January, 1926, the staff had increased to approximately 500, of whom eight were Germans, and by May, 1925, the entire construction of a three-engined aeroplane was accomplished at Limhamn. Several orders for three-engine machines have been received from foreign countries, in particular an order for six from the Chilian Government. A site has been purchased at Malmo and the erection of a new factory is nearing completion.

During 1925, Sweden concluded provisional air traffic agreements with Germany and Holland.

SWITZERLAND.

A sum of 70,000 francs was included in the Federal Budget of 1925 for the assistance of Swiss civil aviation, and in addition considerable sums were also set aside by the Post Office and various cantons and towns. Several new air transport companies were established during the year.

The "Gren. S.A." was formed at the beginning of April, 1925, with headquarters at Geneva, and operated a service Basle-Geneva-Lyons from 17th August, 1925, to 30th September, 1925.

The "Transalpina S.A." was formed at Lausanne and was later combined with the "Aero Lausanne S.A." under the name "Société Transalpina." The town of Lausanne granted a special allowance of 30,000 francs to facilitate the financial reorganisation of the new concern, and, in addition, paid 10,000 francs towards the expenses of some experimental flights between Lausanne and Milan which were carried out by the company during the summer. It is proposed to continue these experimental flights during 1926.

In July, 1925, a company entitled "Société pour le développement du trafic aérien" was formed at Zurich with a capital of 110,000 francs. The object of the company is to assist generally in the promotion of Swiss internal and international air traffic, partly by means of hiring out machines to air traffic companies. The company proposes to operate an air service during the 1926 season between Zurich and Interlaken, *viâ* Lucerne, with flying boats belonging to the firm of Alfred Comte & Cie.

A company known as the "Nhora" ("Navigation horlogère aérienne") was founded by a number of watch manufacturers in the Chaux-de-Fonds and Le Locle districts, mainly with the idea of providing for the rapid transport of clocks, watches and precious metals. The company has concluded agreements with the other air transport companies which will ensure connections with the main international lines.

The "Ad Astra-Aero" Company of Zurich, which operated services over the route Geneva-Lausanne-Zurich-Munich between 20th April, 1925, and 30th October, 1925, underwent a complete reorganisation during the summer. The company is now styled "Ad Astra-Aero Avion Tourisme Suisse S.A." and has a capital of 200,000 francs made up of 16,000 shares. All the shareholders are Swiss.

The following statistics are given of Swiss air traffic in 1925 (excluding flying carried out by foreign companies):—

—	Flights.	Distance, in miles.	Passengers.	Mail, in tons.	Freight, in tons.
Regular air lines -	983	87,427	2,102	2	4½
All other flying -	3,036	82,455	6,862	—	—

ASIA.

JAPAN.

An ambitious programme is being considered for the establishment of air routes, to be put into operation in three stages during a period of from 15 to 20 years. A sum of Yen 371,000 was voted for Civil Aviation in 1925/26.

The services in operation in 1925 were as follows:—

Company.	Route.
Regular East-West Aviation Co. -	Tokyo-Osaka.
Japan Aviation Co., Ltd. -	Osaka-Fukuoka.
Japan Aerial Transport Research Laboratory.	Sakai-Takamatsu-Tokushima.

The newspaper "Asahi" organised a flight from Tokyo to England by two machines, piloted by Major Abe and Mr. Kawachi respectively. The machines used were Breguets constructed in Japan. Starting on 25th July, a route was followed *via* Manchuria, Soviet Russia, Poland, Czechoslovakia, and France. England was reached on 12th October, the machines having completed a distance of 7,300 miles, approximately.

PERSIA.

An agreement for the organisation of civil aviation in Persia has been concluded between the Junkers Company and the Persian Government. Under this agreement the company will operate a service for five years on the Teheran-Enzeli, Teheran-Bushire and Teheran-Qaratou routes. In addition, the company undertakes to connect one of these routes with the European air mail system and to open additional services in Persia in accordance with the requirements of the Persian Government.

The company also agrees to form a Persian aviation company to train a number of Persians as aviators and mechanics, and to establish in Persia a repair factory and a technical school of aviation. The Persian Government is to pay a subsidy based on the number of kilometres flown, in addition to making a fixed monthly payment for the carriage of Government mails.

AMERICA.

ARGENTINA.

The Aero Lloyd Cordoba, which was formed by the German Junkers Company, has extended its Villa Dolores-Cordoba service to Rio Cuarto, and, as an additional activity, the company has opened a flying school.

The Junkers Company has also organised an air mail and passenger service between Buenos Aires and Montevideo. The service commenced on 4th March, 1926. It is understood that a subsidy of \$4,000 m/n per month is paid by the Argentine Government in respect of this service, the company undertaking in return to carry 300 kg. of mails thrice weekly.

BOLIVIA.

A Decree has been issued to the effect that during five years a sum of Bs. 100,000 shall be assigned yearly to subsidise a passenger and mail service Cochabamba-Santa Cruz-Trinidad. By a further Decree, a sum of Bs. 30,000 will be assigned yearly during five years to subsidise a seaplane passenger and mail service between Trinidad and Riberalta.

A German company, the Lloyd Aero Boliviano, has been formed and has asked for a concession for 10 years to operate a passenger and mail service between Cochabamba and Santa Cruz.

BRAZIL.

The French Latecoere Company has established a Brazilian sister company entitled "Companhia Brasileira de Empreendimentos Aeronauticos." (*See also under France.*)

CHILE.

No steps have yet been taken to exploit the concession obtained by M. Luis Testart for the operation of air lines.

COLOMBIA.

The Sociedad Colombo-Alemana de Transportes Aereos has carried out an experimental flight with Dornier "Wal" sea-planes (British Rolls-Royce engines) through Central America, to Key West, Fla., U.S.A., with the object of examining the possibilities of an air mail service between North and South America. As a result of negotiations with the United States Post Office an American company entitled the Inter-American Airways, Inc., has been incorporated in the State of Delaware, U.S.A., to study the organisation of this service.

The following Colombian services are operated regularly by the S.C.A.D.T.A. :—

Barranquilla-Girardot.

Girardot-Neiva.

Barranquilla-Cartagena.

Sabana de Torres-Bucaramanga.

In the latter part of 1925 the company inaugurated its first international service between Barranquilla and Maracaibo (Venezuela).

During 1925, the company flew 183,206 miles, the mail carried weighed 11.7 tons, and passengers numbered 1,124.

The S.C.A.D.T.A. has formed three associated companies, known respectively as the Condor Syndicate, the International Aerial Surveys, and the Compania Santandereana de Aviacion. The former undertakes experimental air transport operations, the second has been very active in planning and carrying out air surveys, and the third is responsible for the operation, on behalf of the S.C.A.D.T.A., of the Sabana de Torres-Bucaramanga service.

U.S.A.

The vote for the Post Office Air Mail Service for 1925-26 is \$2,600,000 as compared with \$2,750,000 for the previous year.

Under the powers given him by the Kelly Act the Postmaster-General has awarded eight air mail contracts as follows :—

<i>Route.</i>	<i>Company.</i>
Boston-New York - - -	Colonial Air Lines.
Chicago-St. Louis - - -	Robertson Aircraft, Inc.
Chicago-Dallas and Fort Worth -	National Air Transport, Inc.
Salt Lake City-Los Angeles -	Western Air Express, Inc.
Elko-Pasco - - - -	W. T. Varney.
Chicago-St. Paul and Minneapolis -	C. Dickenson.
Atlanta-Miami - - - -	Florida Airways Corp.
Chicago-Detroit-Cleveland - -	Ford Air Transport Co.

During the fiscal year ended 30th June, 1925, the Air Mail Service between New York and San Francisco carried 9,300,520 letters. In comparing this figure with that for the fiscal year ended 30th June, 1924, when 60,001,360 pieces of first-class mail were carried, it should be remembered that in the fiscal

year 1923-4 mails were carried without special surcharge, whereas upon the introduction of the through trans-continental schedule, with night flying, on 1st July, 1924, only those letters that were specially franked were transported by Air Mail. During the year ended 30th June, 1925, 2,501,555 miles were flown, against 1,853,251 for the year ended 30th June, 1924.

A night air mail service between New York and Chicago was begun on 1st July, 1925, and is flown regularly in 8-9 hours as against the fastest rail time of 20 hours. The total length of route which has been lighted now amounts to 2,380 miles.

The Ford Air Transport Company has inaugurated services between Chicago, Detroit and Cleveland to link up the Ford plants at these places. Air mail is now carried on this route.

The Huff Daland Dusters, Inc., operated 18 aeroplanes in protective dusting of about 60,000 acres of cotton fields. The service is sold to farmers on contract at a price of \$7.00 per acre for five applications.

Nine Army aeroplanes gave important assistance last summer in protecting forests against fire, while the Department of Agriculture used aeroplanes in an effort to trace the source of Rust germs, which attack grain.

As already mentioned (under COLOMBIA), the S.C.A.D.T.A. of Colombia, in conjunction with American interests, has formed the Inter-American Airways, Inc., to examine the possibilities of an air mail service to join North and South America.

Mr. Daniel Guggenheim, who in the summer of 1925 gave \$500,000 to establish a school of aeronautics at New York University, has decided to establish a fund for the promotion of aeronautics, and to place at its disposal the sum of \$2,500,000.

The Schneider Trophy Contest for 1925 was held on 23rd-24th October, 1925. There were seven entries: United States 3, England 2, Italy 2. The race was won for the United States by Lt. Doolittle, on a Curtiss Army Racer, at an average speed of 232.573 m.p.h. Capt. Broad, flying a Gloster Napier III, representing Great Britain, was second.

The Winslow Bill for the Regulation of Aviation, which was introduced in the Senate in December, 1923, and was referred to the Interstate and Foreign Commerce Committee, was succeeded by the Bingham Bill, which passed the Senate on 16th December, 1925, and in turn was referred to the above-mentioned committee. Later the Merritt Bill was introduced, which is termed an amendment to the Bingham Bill, but is almost completely new.

(Signed) W. S. BRANCKER.

